Report of the Hope Professor of Zoology, 1912.

The two great pieces of work which mark the year 1912 are the transference of the Lepidoptera into the Old Radcliffe Library together with the consequent reorganization of the whole Department, and the meeting of the Second International Entomological Congress in August. In the transference of the collections the permanent staff received very kind help from the Rev. C. F. Thornewill and Mr. F. C. Woodforde, and the removal of the immense mass of delicate specimens was accomplished without any injury.

By the death of Mr. R. Shelford, after years of illness, the Department lost one of its chief friends and one who had worked hard in securing its efficiency. The present condition of the collections of Orthoptera, and especially the *Blattidae*, will remain as a monument to his indefatigable labours.

Mr. R. S. Bagnall, who has been appointed Assistant Curator in succession to Mr. Shelford, has unfortunately been prevented from beginning his permanent work, although able, from time to time, to render valuable assistance. It is confidently hoped that he will be able to come into residence in a few weeks.

1. *The Rothney Collection of Hymenoptera.*

Mr. G. A. James Rothney has continued his generous donations to the Library and to the splendid collection of Hymenoptera presented in 1910.

2. *Additions to the Collection of Lepidoptera from Equatorial Africa.*

It was explained in the Report for 1911 that four great collections from the African Equatorial Zone were almost entirely uncatalogued. In the course of the year one of these, the collection made and presented by the Rev. K. St. Aubyn Rogers, M.A., Wadham College, has been entirely

labelled, catalogued, and incorporated, and a full account of it will be found under the additions for the year 1912; for it was thought convenient that the Collection should be described and acknowledged as a whole under one year, although it had gradually accumulated in the course of eight. It must be added that important instalments, although only a small part of the whole, have been incorporated and acknowledged in some of these years, but form no part of the Collection described on pp. 954–958. A small but important section of Mr. W. A. Lamborn's Collection from the Lagos district of Southern Nigeria has also been catalogued, and will be found acknowledged under the years 1910–12, and a still smaller proportion of Mr. C. A. Wiggins's Collection from the Entebbe district under the years 1909–11. No specimens of Dr. G. D. H. Carpenter's Collection have as yet been catalogued, although those from the mainland to the north and north-west of the Victoria Nyanza are quite ready for numbering and incorporation, as is also the fine series from Damba Island in the Lake. It was, however, thought better to keep all these collections separate until Dr. Carpenter's return in the present summer, so that he could the more conveniently study them. Incorporation of these three collections is one of the principal pieces of work for the immediate future.

A fifth fine collection made by Mr. J. A. de Gaye, F.L.S., F.E.S., of King's College, Lagos, was also presented in the course of 1912, and this will be labelled and incorporated as soon as possible.

3. *Additions to British Collections.*

It will be seen in the list of accessions that an exceedingly important collection of *Empidae* and their prey, presented by Mr. A. H. Hamm, has now been incorporated. The arrangement follows Mr. Hamm's conclusions upon the capture of prey in relation to courtship, and many interesting and novel results will be found on p. 952, where the Collection is briefly described. Mr. F. C. Woodforde, Col. Yerbury,

Mr. H. Donisthorpe, and Dr. Longstaff have also continued their generous assistance to this important section of the Hope Department.

Mr. A. Bacot, F.E.S., who, with Mr. L. B. Prout, F.E.S., presented in 1910 the material of their great series of breeding experiments on *Acidalia virgularia*, has now generously given the material on which his many important papers were founded. A complete account will appear in a future Report, but in the meantime the specimens are at the disposal of all who desire to study insects or the data of heredity.

4. *Work done by the Staff.*

Early in the year the Department lost the services of Mr. W. Holland, who had been an assistant for nearly 20 years. His great services during this period and his generosity to the Collections are described in earlier annual Reports, and now again gratefully acknowledged.

The work done by Mr. A. H. Hamm and Mr. Joseph Collins is really sufficiently indicated by studying the list of accessions in the later pages of this Report. Furthermore, a great deal of extra labour was thrown upon them by the necessity for the reorganization of the entire Department in consequence of the removal into the Old Radcliffe Library, and by the Entomological Congress.

The loan collection of British Birds deposited by Mr. F. C. Woodforde has been cleaned, arranged, and provided with labels. A list of several of the rarest species, presented by Mr. Woodforde, will be found on p. 961.

5. *Work on the Collection of Pierinae.*

Dr. F. A. Dixey, F.R.S., has kindly drawn up the following report :—

"During 1912 several large collections of Pierines were worked out, and no less than 950 specimens incorporated in the Collection. About 500 of these were collected and presented by the Rev. K. St. A. Rogers in British East

Africa; they include *Teracolus sipylus*, Swinh. (the large form of *T. casta*, Gerst.), a fine series of *Mylothris rubricosta*, Mab., two specimens of which were abnormal in venation, two females of a species of *Teracolus*, at present unnamed, allied to *T. lais*, Butl., an exceptionally 'dry' specimen of *T. achine* reared on desiccated food, and other interesting forms. The two fine collections of Pierines made by Dr. Longstaff in the region of the White Nile were worked out and 255 specimens were incorporated during 1912. These included a good series of the rare *Calopieris eulimene*, whose affinities are still doubtful, and of the almost equally rare *Teracolus ephyia*, Klug. The former of these is new to the Collection, and the latter was only represented by one imperfect specimen. Other specimens incorporated were from collections presented by Mr. E. A. Elliott from Lanzarote, Canary Islands, Mr. J. C. F. Fryer in Aldabra, Dr. R. C. L. Perkins in N. Queensland, Mr. G. F. Leigh in the Comoro Islands, and Rev. J. U. Yonge in Madagascar. Among these the following were new to the Collection:—*Teracolus aldabrensis*, *Delias nigidius*, *Mylothris ngaziya*, *Terias desjardinsii*."

At the International Congress of Entomology, Dr. F. A. Dixey read a paper on the Scent-distributing Organs of the *Pierinae*, and arranged an exhibition which included about two-thirds of the Hope Collection of that Sub-family. Papers on the Pierine genus *Pinacopteryx*, and on the species of *Teracolus* allied to *T. ephyia* were contributed by him to the Proceedings of the Entomological Society of London (see p. 15).

6. *Work on the Collection of Acraeinae, &c.*

Mr. H. Eltringham, M.A., F.Z.S., F.E.S., New College, completed and saw through the press the MS. of his two years' labours on the *Acraeinae*. This monograph, occupying the whole of Part I (pp. 1–374) of the Trans. Ent. Soc. for 1911, was issued just in time for the Entomological Congress which met in August. The monograph contains sixteen plates, of which six are coloured, and is provided with an index separate from that of the Transactions for the year.

It is the standard work from which all the Museums of the world and all the private collections must determine and arrange the species of this important group of butterflies. In the course of its preparation the author has seen every accessible type and has dissected the male armature of every available species, and there were very few which he was unable to obtain for this purpose. Special mention must also be made of a most useful alphabetical list of types with a statement of their location so far as it is known. As soon as the monograph was published Mr. Eltringham arranged the University collection of *Acraeinae*, and about 80 of the drawers were on exhibition in one of the rooms of the Linacre Professor throughout the week of the Congress.

In collaboration with Dr. Karl Jordan Mr. Eltringham completed the section *Acraeinae* for the "Lepidopterorum Catalogus"—a work that has since been published (Berlin, 1913). With the same author he has completed the section *Acraeinae* for Wytsman's "Genera Insectorum" (Brussels). Mr. Eltringham has also been engaged upon the following researches:—

(1) Preliminary investigations into the urticating properties of the imago stage of *Porthesia similis*, *P. chrysorrhoea*, *Anaphe infracta*, and other Lepidoptera. (Proc. Ent. Soc., 1912, p. lxxviii.) This investigation, upon which he is still engaged, was suggested by Mr. W. A. Lamborn's observations in the Lagos district.

(2) Preliminary investigation into the structure of the male genital armature in certain species of *Heliconius*.

(3) The histological structure of the scent patches and abdominal brushes in the male *Amauris niavius*, described and figured in a paper read before the Entomological Society, to be published in the course of the present year.

7. *Work on the British Collections of Coleoptera.*

During the past year Commander Walker has continued his kind help, and has made considerable progress in the remounting and rearrangement of the Clavicorn Coleo-

ptera in the Hope-Westwood Collection. The *Anisotomidae* have been completed, as well as the larger *Silphidae*, the *Erotylidae*, *Endomychidae*, *Byrrhidae*, *Histeridae*, *Phalacridae*, and *Coccinellidae*, the last-mentioned family containing many examples of named varieties bearing Haworthian labels—of special interest as preserving the names by which these forms were known to the older Coleopterists. The great majority of the insects dealt with have made excellent specimens, and their examination is much facilitated by cleaning, repinning with suitable pins, and carding. Included in the above statement are the numerous specimens of these families contributed in past years to the Museum by Mr. H. St. J. Donisthorpe.

8. *Work on the British Collections of Lepidoptera.*

The butterflies and a part of the moths have been thoroughly rearranged by Mr. F. C. Woodforde, who has brought together the scattered collections of British Lepidoptera in the Department. This great service to the University involved residence in Oxford during last autumn and winter. As the result of this kind help, the specimens are now more instructive as well as far more available for the use of the student.

9. *Assistance in working out the material of the Department.*

Mr. W. A. Lamborn lived in the neighbourhood of Oxford for a large part of the year and gave much kind help in the arrangement of his collections, and later wrote two important papers which will be published in the immediate future. His work has just been recognized by his appointment as Entomologist to the Agricultural Department of Southern Nigeria and he has lately returned to the West Coast in order to undertake the duties of the office. The working out of his material, which ranges over many groups of insects, has required the co-operation of a number of naturalists. The Ants have been determined by Professor August Forel. Mr. W. C. Crawley kindly took the whole collection by hand to Switzerland, and brought it back when the work was done. Some of the Homoptera have been determined and many

new species described by Mr. W. L. Distant; other Homoptera, including the *Coccidae*, by Professor R. Newstead, F.R.S. The new *Lycaenidae* have been worked out by Mr. G. T. Bethune-Baker; Micro-Lepidoptera by Mr. J. Hartley Durrant. The whole of these researches will form an appendix to the paper embodying Mr. Lamborn's important observations on the Ants of the Lagos district in their relation to *Lycaenidae* and other insects.

The Rev. K. St. Aubyn Rogers spent a fortnight in Oxford arranging the African *Lycaenidae* and incorporating his own exceedingly important contribution to this group. The kindest assistance has been rendered, as in previous years, by the staff of the Insect Department of the British Museum of Natural History, as also by the Hon. W. Rothschild, F.R.S., and Dr. Karl Jordan of the Tring Museum, by Mr. Hamilton Druce, by Mr. G. T. Bethune-Baker, by Mr. Roland Trimen, F.R.S., and Mr. L. B. Prout.

An important manuscript on the African *Braconidae*, representing an immense amount of careful labour, has been left by the late G. H. Grosvenor. Dr. R. C. L. Perkins paid a special visit in order to examine this work as well as the material on which it is based, and it is hoped that the whole will be published in accordance with his kind suggestions and advice.

10. *Visits of Naturalists: the Second International Entomological Congress.*

Apart from the meeting of the Congress in August, the Hope Department has been visited by the following naturalists, who have generously helped with material or with assistance in working out the collections:—Mr. G. T. Bethune-Baker, F.L.S., Pres. Ent. Soc.; Mr. Horace Donisthorpe, F.E.S.; Mr. E. A. Elliott, F.Z.S., F.E.S.; Mr. C. A. Foster, F.E.S.; Dr. K. Jordan, Ph.D., F.E.S.; Mr. W. A. Lamborn, M.R.C.S., L.R.C.P., F.E.S.; Dr. G. B. Longstaff, M.A., D.M., F.R.C.P., F.E.S., New College; Professor R. Meldola, Hon. D.Sc., F.R.S., F.E.S.; Mr. Guy A. K. Marshall, F.E.S., Scientific Secretary to the Research Committee of the Colonial Office;

Mr. J. C. Moulton, B.Sc., Magdalen College, Curator of the Sarawak Museum, Kuching, Borneo; Mr. S. A. Neave, M.A., B.Sc., Magdalen College; Hon. Walter Rothschild, F.R.S., F.L.S., F.E.S.; Dr. H. Schouteden, Director of the Museum of the Congo, Tervueren, near Brussels; Rev. J. U. Yonge, M.A., Keble College.

The Department was also visited by Professor W. Bateson, F.R.S.; Professor Vernon L. Kellog, of the Leland Stanford University, California; Dr. F. A. Lucas, Director of the American Museum of Natural History, New York; Sir Henry Miers, F.R.S.; and Dr. Henry Skinner, of Philadelphia.

It is unnecessary to give an account of the Entomological Congress on the present occasion, for a full Report is in course of preparation. It is right to say that the meeting in Oxford of so many eminent representatives of the science from all parts of the world was, and has since been, a great source of strength to the Hope Department. It is also impossible to leave the subject without thanking Mr. Eltringham for his work, first as Local Secretary, and then—through the illness of the wife of Dr. Malcolm Burr, the elected officer—as General Secretary. His self-sacrificing labours were shared by his friend, the late G. H. Grosvenor, who rendered at the Congress his last service to Oxford. Dr. Dixey and Commander Walker, in Oxford, and Dr. Karl Jordan, Dr. Longstaff, and Professor Selwyn Image, paying many visits, all helped in the kindest manner to carry out the necessary arrangements for the meeting. A great deal of work also fell upon the assistants in the Hope Department, Mr. Hamm and Mr. Collins, who worked hard to place the Collections at the disposal of the members.

The success of the meeting was also due to the kind permission given by the Delegates of the Museum, to colleagues the Heads of the Museum Departments, to Colleges—especially Wadham, New College, and Merton—where members were given rooms and otherwise entertained, to Oxford residents who offered hospitality, and, above all, to the Warden of Wadham, who generously lent his private garden to the Congress, and permitted a tent to be erected in it.

The meeting of Entomologists, which usually takes place in July, was considered in 1912 to be merged in the Congress. A nearly complete record of those who attended is preserved in the Visitors' Book of the Hope Department—going back to the date, June 12, 1850, when many members of the University visited the collections, which had just arrived, and were accommodated in the Taylorian Building. From that date up to August, 1912, the book presents a very interesting record of the students of insects who have visited the Hope collections in Oxford. At the opening of the Congress on August 5 there were only some half-dozen blank pages left in the book, and these are now filled with 175 signatures of those who attended the meeting, August 5–10.

11. *Works published in* 1912.

The following papers appeared in the Transactions of the Entomological Society of London for 1912:—

Pt. I, No. I.—A Monograph of the African species of the Genus *Acraea*, Fab., with a supplement on those of the Oriental Region, by Harry Eltringham, M.A., F.Z.S., F.E.S., New College.

Pt. II, No. II.—South African and Australian Aculeate Hymenoptera in the Oxford Museum, by the late Col. C. T. Bingham, F.Z.S.

Pt. II, No. IX.—The Study of Mimicry (Batesian and Müllerian) by Temperature Experiments on two Tropical Butterflies, by Lieut.-Colonel N. Manders, R.A.M.C., F.Z.S., F.E.S.

Pt. IV, No. XII.—Studies of the *Blattidae*, by the late R. Shelford, M.A.

Pt. IV, No. XIV.—The Colour-groups of the Hawaiian Wasps, &c., by R. C. L. Perkins, D.Sc., M.A., Jesus College.

Pt. IV, No. XV.—Synaposematic resemblance between Acraeine larvae, by G. D. H. Carpenter, B.A., B.M. (Oxon.), F.E.S., Member of the Royal Society's Sleeping Sickness Commission.

Pt. IV, No. XVI.—The Life History of *Pseudacraea eurytus hobleyi*, Neave, by G. D. H. Carpenter, B.A., B.M. (Oxon.), F.E.S.

The following short papers, notes, and brief descriptions of the material of the Department, exhibited at the meetings of the Entomological Society of London in 1912, have been published in the Proceedings:—

Feb. 7, 1912, p. iii. Geometrid moths of the genus *Aletis* and their mimics, collected in the neighbourhood of Entebbe, by C. A. Wiggins, D.P.M.O. of the Uganda Protectorate.

Feb. 7, p. iv. *Hypolimnas* (*Euralia*) *dubius*, Beauv., proved to be a Mendelian dominant, and *H.* (*E.*) *anthedon*, Boisd., recessive, by W. A. Lamborn, M.R.C.S., L.R.C.P., Entomologist to the Agricultural Department of S. Nigeria.

Feb. 7, p. iv. Butterflies a natural food of Monkeys, by W. A. Lamborn.

Feb. 7, p. iv. The Urticating Hairs of a Lasiocampid larva disseminated through the air, by W. A. Lamborn.

Feb. 7, p. v. The Anal Tufts of the female Pierine butterfly *Glutophrissa saba* protruded during courtship, by W. A. Lamborn.

Feb. 7, p. vii. Discussion of Col. Manders's paper, "The Study of Mimicry (Batesian and Müllerian) by Temperature Experiments on two Tropical Butterflies," by Rev. G. Wheeler, F. E. Merrifield, Dr. T. A. Chapman, and the Professor.

March 6, p. xii. Three families of *P. dardanus*, Brown, bred from *hippocoon*, F., females, in the Lagos district, by W. A. Lamborn.

March 6, p. xvii. Monkeys eating Butterflies, by Capt. H. V. Neal.

March 6, p. xviii. Determination of the Coccid food of the larva of *Spalgis lemolea*, H. H. Druce, by Prof. R. Newstead, F.R.S.

March 6, p. xviii. *Eurytela dryope*, Cramer, shown to be distinct from *E. hiarbas*, Drury, by W. A. Lamborn.

March 6, p. xix. Further captures of Pseudacraeas, &c., on Damba Island, near Entebbe, by Dr. G. D. H. Carpenter.

March 20, p. xxv. A Coleopteron new to Britain, by Commander J. J. Walker, Hon. M.A., F.L.S., Sec. E. S.

March 20, p. xxvi. Lepidoptera with the "*Neptis*" pattern, collected near Entebbe in 1909, by C. A. Wiggins.

March 20, p. xxviii. *Neptis swynnertoni*, a new species from S.E. Rhodesia, by Roland Trimen, Hon. M.A., F.R.S.

March 20, p. xxxi. Two African species of the Danaine genus *Tirumala* (*Melinda*) as models, and one as a mimic, by the Professor.

March 20, p. xxxii. A large Lepidopterous pupa, probably Lycaenid, found in the leaf-nest of *Oecophylla*, in the Lagos district, by W. A. Lamborn.

March 20, p. xxxiii. The sluggishness of two W. African *Lycaenidae* of the genera *Epitola* and *Hewitsonia*, by W. A. Lamborn.

March 20, p. xxxiv. The male *Amauris egialea* stroking the brands of the hind wings with its anal tufts, by W. A. Lamborn.

March 20, p. xxxv. Discussion of the above observation by Dr. F. A. Dixey, M.A., D.M., F.R.S., Wadham College, and Prof. Kellog.

May 1, p. xlii. A very scarce Egyptian Pierid, by G. B. Longstaff, M.A., D.M., F.R.C.P., New College.

May 1, p. xlii. Birds and Insects at the edge of fire, by Dr. G. B. Longstaff.

May 1, p. l. Mimicry in the Tropics chiefly characteristic of Forest Areas: The Birds and Lizards of the Forest and the Open, by His Excellency the Governor of Uganda, C. A. Wiggins, C. F. M. Swynnerton, F.E.S., and the Professor.

May 1, p. liii. The Power of Sight in Birds, by Dr. Monckton Copeman, F.R.S., and the Professor.

May 1, p. lv. A Wagtail devouring Lycaenid and Pierine

Butterflies but rejecting an *Acraea*, near Entebbe, by S. A. Neave, M.A., B.Sc., Magdalen College.

May 1, p. lv. *Neptis* and *Neptidopsis* in the Lagos district, by W. A. Lamborn.

May 1, p. lvi. *Eurytela hiarbas* and *E. dryope*, by Roland Trimen.

May 1, p. lvi. Abstract and discussion of Dr. R. C. L. Perkins's paper "On the Colour-Groups of the Hawaiian Wasps", by the Professor.

June 5, p. lxviii. Two Uncommon Sudanese Pierine Butterflies, by Dr. G. B. Longstaff.

June 5, p. lxx. Mimetic East African Asilid flies and Butterflies (*Pseudacraea*), by S. A. Neave.

June 5, p. lxxiii. Heredity in the female forms of *Hypolimnas misippus*, L., by Rev. K. St. Aubyn Rogers, M.A., F.E.S., Wadham College.

June 5, p. lxxv. The Tsetse-fly *Glossina caliginea*, Austen, rejected by a Monkey, by W. A. Lamborn.

June 5, p. lxxv. Families of Nymphaline and Danaine Butterflies bred in the Lagos district, by W. A. Lamborn.

June 5, p. lxxviii. The Breeding of *Eurytela hiarbas*, Drury: a correction, by W. A. Lamborn.

June 5, p. lxxviii. The urticating hairs of the moths *Anaphe infracta*, Walsingham, *Porthesia similis*, and *P. chrysorrhoea*, by W. A. Lamborn and H. Eltringham.

June 5, p. lxxxi. The cocoons of the African Lasiocampid moth *Chrysopsyche varia*, Walk., by Dr. G. D. H. Carpenter.

June 5, p. lxxxii. The warning colours of the Hypsid moth "*Callioratis*" *pactolicus*, Butl., in all its stages, by Dr. G. D. H. Carpenter.

June 5, p. lxxxiii. Diurnal movements of Acraeine pupae, by Dr. G. D. H. Carpenter.

June 5, p. lxxxiv. Pseudacraeas of the *hobleyi* group on the Sesse Islands in the Victoria Nyanza, by Dr. G. D. H. Carpenter.

Oct. 2, p. lxxxvii. Coleoptera from Oxford and insect-catching grass, by Commander J. J. Walker.

Oct. 2, p. lxxxviii. The flower-like arrangement of African Flatas (Homoptera), by C. J. Gahan, Dr. A. C. Parsons, W. A. Lamborn, and the Professor.

Oct. 2, p. xc. *Enchelia jacobaeae*, L., captured and then abandoned by a Robin, by Roland Trimen.

Oct. 16, p. xcvii. Occasional migration due to excessive drought as a cause of the spread of Butterflies into new localities, by Rev. K. St. Aubyn Rogers, M.A., F.E.S., Wadham College.

Oct. 16, p. xcix. The special development of Mimicry in forest Butterflies, by C. F. M. Swynnerton.

Oct. 16, p. c. *Eurytela hiarbas*, Drury, and *E. dryope*, Cramer, by G. F. Leigh.

Oct. 16, p. c. Müllerian mimicry between Australian Bees, by Dr. R. C. L. Perkins.

Oct. 16, p. ci. Cocoons of *Norasuma kolga*, H. Druce, spun under natural conditions, by W. A. Lamborn.

Oct. 16, p. ciii. Synaposematic resemblance between Acraeine larvae, by Dr. G. D. H. Carpenter. Additional note in reading the above paper by the Professor.

Nov. 6, p. cvi. A myrmecophilous African Lycaenid, by W. A. Lamborn.

Nov. 6, p. cvi. The value of photographs, even when greatly reduced, as a record of habits, attitudes, &c., by Dr. C. William Beebe.

Nov. 6, p. cvi. The production of the spherical structures on the Cocoons of the Tineid moth *Epicephala chalybaema*, Meyr., by E. E. Green, F.E.S.

Nov. 6, p. cix. The West African Agaristid moth *Messaga monteironis*, Butler, a mimic of the Hesperid *Pyrrhochalcia iphis*, Drury, by J. A. de Gaye, F.L.S., F.E.S.

Nov. 6, p. cx. The Pierine genus *Pinacopteryx*, by Dr. F. A. Dixey, M.A., D.M., F.R.S., Wadham College.

Nov. 6, p. cxiv. Protective resemblance of an African Acridian to grass-stems charred by native fires, by A. Bacot, F.E.S.

Nov. 6, p. cxiv. Gigantic W. African Lasiocampid larvae, by H. Eltringham.

Nov. 6, p. cxiv. The Life-History of *Pseudacraea eurytus hobleyi*, Neave, abstract and further notes, by Dr. G. D. H. Carpenter.

Nov. 20, p. cxix. Families of Nymphaline and Pierine butterflies bred in the Lagos district, by W. A. Lamborn.

Nov. 20, p. cxxi. Example of the complex struggle for life among insects in the W. African tropics, by W. A. Lamborn.

Nov. 20, p. cxxiii. The Butterflies of the White Nile, a study in Geographical Distribution, by Dr. G. B. Longstaff: discussion of above paper.

Dec. 4, p. cxxx. Metallic colour in Chrysids, by Dr. G. B. Longstaff: discussion.

Dec. 4, p. cxxxi. The forms of *Leuceronia argia*, F., in the Lagos district of West Africa, by W. A. Lamborn.

Dec. 4, p. cxxxi. Three families of *Papilio dardanus*, Brown, bred from known female parents in the Lagos district of West Africa (1912), by W. A. Lamborn.

Dec. 4, p. cxxxiv. Families of *Papilio dardanus*, Brown, bred in Natal from female parents of the *trophonius*, Westw., form, by Miss M. E. Fountaine and G. F. Leigh.

Dec. 4, p. cxxxvi. Further families of Pseudacraeas of the *hobleyi* group bred on Bugalla in the Sesse Archipelago, by Dr. G. D. H. Carpenter.

Dec. 4, p. cxxxviii. The Cocoons of *Epicephala chalybaema*, Meyr., by T. Bainbrigge Fletcher, F.E.S.

Dec. 4, p. cxxxviii. A richly coloured example of *Planema arenaria*, E. M. Sharpe, from the Sesse Islands in the Victoria Nyanza, by Dr. G. D. H. Carpenter.

Dec. 4, p. cxxxviii. The effect of hot and cold climate

upon the colours of *Chrysophanus phlaeas*, L., by Dr. R. C. L. Perkins.

Dec. 4, p. cxli. Some African species of the genus *Teracolus*, by Dr. F. A. Dixey.

In the *Entomologist's Monthly Magazine* for 1912:—

pp. 79–84. Unintentional evidence of Mimicry in Bornean Butterflies, by J. C. Moulton, B.Sc., Magdalen College, Curator of the Sarawak Museum, Kuching, Borneo.

"Butterfly Hunting in Many Lands," by Dr. G. B. Longstaff, containing an account of the author's journeys and experiences in the field, and representing a large amount of work during many years in the Hope Department. The work contains, as an appendix, translations by Mr. E. A. Elliott, F.Z.S., of papers by Fritz Müller on the scent-organs of butterflies and moths originally issued in various publications, some of them very inaccessible.

12. *Forthcoming Volumes of Hope Reports.*

The great pressure due to the transference and rearrangement of the collection in 1912, and to the Entomological Congress, prevented the appearance of the eighth Volume. There is now the material for two Volumes of Reports of the large octavo size of Vols. I–VII, and also one or perhaps two Volumes containing papers of a larger size. It is hoped that all the material now collected in the Department will be issued in the course of the present summer.

Additions to the Collections in 1905.

A beautiful series of 84 Lycaenid butterflies from the Nicobar Islands (April–June, 1904) was presented by the captor, Gilbert Rogers, Esq. The remainder of this generous donation was acknowledged in the Report for 1906, but the *Lycaenidae* having been kindly named by Mr. H. H. Druce, F.L.S., had been put aside in order that the determinations might be affixed to the specimens. This has now been done, and all are incorporated in the collection.

Thirteen butterflies and 25 moths, including some interesting species of *Agaristidae*, were presented by C. A. Wiggins, Esq., D.P.M.O. of the Uganda Protectorate. The specimens were taken by a native collector at Taveta (2,500 ft.), B. E. Africa, in May, 1905.

Additions to the Collections in 1909.

A fine collection of insects of various Orders from localities in the neighbourhood of Cairo and Khartum and in many parts of Upper Egypt was presented by the captor, Dr. G. B. Longstaff, D.M., F.R.C.P., New College. The data are detailed and precise, including a record of the latitude of the small places on the White Nile above Khartum. The specimens were captured between the beginning of January and mid-April, 1909. The following groups are represented:—

Lepidoptera Rhopalocera.—194, including a fine series of the forms of *Danaida chrysippus* (the single example of *dorippus* was of the white hind-winged *albinus* form), and 8 *Calopieris eulimene*, a very interesting Pierine excessively rare in collections.

Lepidoptera Heterocera.—177, including some very rare species.

Hymenoptera.—96 ants and *Mutillidae*, 185 Fossores, 71 Diploptera, 203 Anthophila, 47 *Chrysididae* (the above Hymenopterous groups being very kindly worked out by Rev. F. D. Morice, M.A., F.E.S., Queen's College), 5 Parasitica.

Diptera.—57.

Neuroptera.—23, including 16 Odonata.

Coleoptera.—The specimens numbered many over 130, because two or more examples of all the smaller species were mounted on a single card.

Hemiptera.—52.

Orthoptera.—69, including 9 *Forficulidae*. The collection also included 3 Arthropoda outside the Insecta.

Seven Coleoptera from the southern slope of Vesuvius

(April 23) and a Reduviid bug from the deck of the steamer at Gibraltar (April 27), captured by Dr. Longstaff on his journey home, were also presented by him to the Hope Collection.

A fine series of Tabanid flies from Northern Rhodesia and the South-east of the Congo State was presented by the captor, S. A. Neave, Esq., M.A., B.Sc., Magdalen College: 91 have been catalogued, and together with large numbers of additional specimens incorporated in the Collection. The interest and value of the donation has been greatly increased by the fact that all the species have been determined by Mr. E. E. Austen of the British Museum. A brief account of the localities visited by Mr. Neave in 1909 has been published in the Reports of earlier years.

Sixty-eight *Acraeinae* from N.E. Rhodesia and the S.E. of the Congo State were also presented by S. A. Neave, Esq. This series, which is an addition to the splendid collections acknowledged in earlier Reports, contains the following interesting types or paratypes of the genus *Acraea*:—*A. mansya*, Eltringham; *chambezi*, Neave; *mima*, Neave; *lualabae*, Neave; *diogenes*, Suff. (*lactea*, Neave); and *sotikensis katana*, Eltringham. Four examples of *Planema poggei* are also included in the series.

Two *Lycaenidae*, including 1 *Deloneura ochrascens*, from Pemba village (about 300 ft.), Duruma country, about 25 miles W. of Mombasa and 10 S.W. of Rabai, were presented by the captor, O. F. Watkins, Esq.

Thirty-eight butterflies collected in June–July, 1909, in the Ambinanindrano district, Madagascar (400–500 ft.), were presented by the captor, Rev. J. U. Yonge, M.A., Keble College. The series includes *Acraea igati*, *Hypolimnas drucei*, *Neptis kikideli*, &c.

Five African Diptera, presented by the Entomological Research Committee of the Colonial Office, have been added to the Collection.

Forty-one butterflies and one moth, collected in 1909 by C. M. Dammers, Esq., in the mountain forests (3,000–

6,000 ft.) near Concepcion, in the Tucuman Province of N.W. Argentine, were presented by J. Blamey, Esq. The locality renders this little collection of especial value to the Department, for the tropical species of *Ithomiinae*, *Heliconinae*, &c., were taken near the southernmost limit of their range. The mountain *Satyrinae* include fine species new to the University collection.

Six *Nycteribiidae* were presented by the captor, Hugh Scott, Esq., M.A., Trinity College, Cambridge.

Additions to the Collections in 1910.

The following part of the splendid series collected in the neighbourhood of Oni Camp, 70 miles E. of Lagos, and presented by W. A. Lamborn, Esq., have been catalogued and added to the collection:—64 *Papilioninae*, including 4 *P. zalmoxis*, 4 *cynorta*, 1 *hesperus*, 5 *leonidas*, and 10 ♂ *dardanus*, and, for the bionomic series, 3 specimens injured probably by the attacks of enemies, namely, 1 *dardanus* ♀ f. *hippocoon*, 1 *hesperus*, and 1 *nireus nireus*. Bred specimens, together with the pupa-cases from which they emerged, are present in the series of the following species:—*nireus nireus*, *demodocus*, *menestheus*, *policenes*, and *dardanus*. The *Acraeinae* added to the collection include 100 *A. pentapolis*, of which a single specimen was bred from a wild pupa, and the remainder formed a part of the butterflies bred from 3 companies of larvae, together with the whole of those bred from a fourth company. Many pupal cases and larval skins have been labelled and added to the collection. This species is dimorphic—some of the butterflies being yellow- and some red-marked. The proportion between these two forms is well shown, especially in the entire Company 4, of which 35 specimens were red- and 30 yellow-marked. *A. rogersi lamborni*: 107 specimens, including in this number many pupae and larval skins. Among the examples are the whole of the 21 specimens reared from a single company of larvae and a part of a second company. The whole series of this species consists, with a single exception, of bred specimens. It includes the ♂ and ♀ types of the subspecies *lamborni*,

Eltringham. *A. quirina*: 11 specimens captured and 1 bred, 52 specimens, including several pupae and some larval skins, bred from a number of larvae which had scattered, but almost certainly belonged to a single company. A single specimen of this species found on the upper side of a leaf with both hind wings shorn off has been added to the bionomic series. *A. admatha*: the 22 catalogued specimens include many bred imagines, together with their pupa-cases and larval skins, and the same is the case with many of the 44 examples of *A. zetes*. The Acraeas also included single examples of *neobule seis* and *camaena*, and 2 of *cgina*.

A portion of the extremely fine collection from the neighbourhood of and within the forest on Mt. Chirinda (about 3,800 ft.), Melsetter, Gazaland, S.E. Rhodesia, collected over two or three years previous to 1910 by C. F. M. Swynnerton, Esq., and presented by him, has now been catalogued and the specimens incorporated. Of *Papilio dardanus* there have been incorporated in the general collection 22 ♂s and 20 *hippocoon* ♀ s, and of *Papilio echerioides*, 36 ♂s and 14 ♀ s. A fine mimetic group shows the relationship, on both the upper and under surfaces of the wing, of these two Papilios to their Danaine models. It includes 2 *Amauris niavius dominicanus*, with their mimics 2 *hippocoon* ♀ s of *dardanus*; 2 *Danaida chrysippus*, with their mimics 2 *trophonius* ♀ s of *dardanus* (one of these latter had been presented in 1905 by G. A. K. Marshall, Esq.); 2 *Amauris echeria lobengula* and 2 *Am. albimaculata*, with their mimics 2 *cenea* ♀ s of *dardanus* and 2 ♀ s of *P. echerioides*. Two ♂s of the latter species were added for comparison. The whole of this group was captured in or in the immediate neighbourhood of the small patch of virgin forest on Mt. Chirinda.

The *Acraeinae* of this great donation have also been incorporated, 208 having been permanently catalogued and large numbers of additional specimens added to the University Collection. This fine series includes 4 *Acraea rabbaiae*, 2 *satis*, 4 *machequena*, 15 *egina arcca*, 3 *acrita*, 18 *aglaonice*, 28 *igola*, 26 *esebria* including fine varieties of ♀, 8 *johnstoni*, 7 *Planema aganice*. The whole series gives a very fine idea

of the species of *Acraeinae* found in this interesting locality and the proportions which obtain between them.

Thirty pupa-cases of *Pseudacraea imitator*, 21 of *Ps. lucretia*, and 4 of *Ps. boisduvali trimenii* from the Durban district, presented by the late A. D. Millar, Esq., of Durban, have been added to the collection.

Four specimens of *Teracolus aldabrensis* (Jan. 1–7, 1909) from Aldabra Island were presented by J. C. F. Fryer, Esq.

A fine series of 213 American Hymenoptera were presented by G. A. James Rothney, Esq., a valuable addition to the splendid collection given and continually enriched by the donor.

Six *Ornithoptera*, 1 *Papilio*, and 3 *Kallima* from various localities were presented by the Hon. Walter Rothschild, F.R.S.

Additions to the Collections in 1911.

A large number of specimens presented in 1911 have been catalogued and incorporated in 1912. The additions to the British collections are especially notable.

Of the splendid collection presented in 1911 by W. A. Lamborn, Esq., the following very small proportion has been incorporated. All specimens were captured or bred by the donor in the neighbourhood of Oni Camp, 70 miles E. of Lagos.

Thirty-seven *Papilioninae*, including *P. dardanus*, *cypraeofila*, *cynorta*, and *menestheus*. Many of the specimens were bred, and the precise pupa-cases have been preserved and are now labelled so as to record the relationship with the respective imagines. The pupa-cases of *P. menestheus* and *policenes* are especially important; for the donor has proved that in these species there is a marked power of colour adjustment to the immediate environment of the pupa. The Papilios also include, for the bionomic series, a ♂ and ♀ *P. cynorta* with injuries probably inflicted by enemies, and an example of *P. demodocus* which, while *in cop.* with another, was being eaten by a Mantis.

One bred example of *Acraea rogersi lamborni* and 3 of

A. admatha with their respective pupa-cases, and, for the bionomic series, a ♀ *A. zetes*, which was seized and then dropped by a lizard.

The *Acraeinae* collected in the Entebbe district in 1909–11, and presented by C. A. Wiggins, Esq., M.R.C.S., F.E.S., D.P.M.O. of the Uganda Protectorate, were, with the exception of those set aside for the bionomic series, catalogued under their separate years and incorporated in the collection. For 1909, 123 specimens were incorporated; for 1910, 100; for 1911, 11. In order to avoid repetition all are gratefully acknowledged under a single year—1911. Among the species are *A. pentapolis*, *admatha leucographa*, *insignis*, *caecilia*, *viviana*, *orina*, *pelasgius*, *semivitrea*, *orestia*, *quirinalis*, *perenna*, and *althoffi*. The series includes a single ♂ of *Planema aganice montana*, which, although very rare, just enters the district from its metropolis in the East. It is hoped that the remainder of the splendid collection presented by the generous donor will soon be incorporated.

The following additions to the bionomic series were presented by C. F. M. Swynnerton, Esq. The specimens were taken in 1911 on the outskirts of Chirinda forest, Gazaland, S.E. Rhodesia:—a *hippocoon* ♀ of *P. dardanus*, taken by a native collector (Sept. 8) from a M'lanje Bulbul (the head was wanting, and the wings showed symmetrical injuries similar to those often seen in living butterflies); the wings of the dry-season form of *Precis archesia* and the fragments of a cockroach, *Deropeltis* sp., taken (June 25) from a spider's web. These examples are recorded in Proc. Ent. Soc., 1911, pp. lxxii–lxxiii.

Seven butterflies from Kibigori, about 20 miles E. of Kisumu, British East Africa, and an example of the rare Danaine butterfly *Amauris ansorgei* (June 18), Uganda Railway, high up on the Mau Escarpment, were presented by the captor, W. M. Griess, Esq. The needs of the Hope Department were kindly brought to the notice of the donor by Rev. C. F. Thornewill, M.A.

Thirteen butterflies from various African localities were presented by the late Herbert Druce, Esq., F.L.S.

The following African insects were presented by the Entomological Research Committee of the Colonial Office:—26 Diptera, 15 Lepidoptera Heterocera, 8 Orthoptera, 17 Coleoptera, 14 *Flatidae* (Homoptera), and 117 Hymenoptera. The specimens had been captured in N.E. Rhodesia, B. C. Africa, and B. E. Africa by S. A. Neave, Esq., in Uganda by C. C. Gowdey, Esq., B.Sc., and in S. Nigeria by Dr. J. J. Simpson. The Hymenoptera have been named in the British Museum by Rowland E. Turner, Esq., and G. Meade-Waldo, Esq.

A collection from the Comoro Islands (1911), purchased from Mr. G. F. Leigh, F.E.S., contains the following specimens:—from Mayotta, 63 butterflies, 20 moths, and 6 Longicorn beetles; from Johanna, 55 butterflies, including 9 *Amauris ochleides affinis* and 3 *Acraea esebria* f. *masaris*, and 28 moths; from Grand Comoro, 444 Lepidoptera, including very long series of Satyrine species, of *Acraea ranavalona*, *Mylothris ngaziya*, and *Euchromia madagascariensis*, 8 *Am. ochleides affinis*, 17 *Neptis comorarum*, and 3 *Acraea esebria* f. *masaris*. Many duplicates will be available for exchange.

The three fine collections of Hymenoptera presented by G. A. James Rothney, Esq., F.E.S., have now been labelled and placed in vacant drawers at the end of the cabinet containing the Rothney Collection of Oriental Hymenoptera. They consist of the following series:—(1) 1,100 specimens purchased from Hermann Rolle of Berlin: the localities are very varied—Madagascar and the surrounding islands, many parts of Africa, Formosa, China, India, Ceylon, Java, New Guinea, Cuba, &c.; (2) 732 specimens from the Van de Poll Collection, mostly from Java; (3) 605 specimens collected by F. P. Dodd in Queensland, principally at Townsville and Kuranda, near Cairns. The collection also contains, from the same locality, 28 Diptera, 20 Neuroptera, 64 Rhynchota, 37 Orthoptera, 26 ova, larvae, pupae, &c., and 35 Arachnids. The numbers are larger than those given, as two or more specimens on one card have only been catalogued as one.

Six larval cases of Psychid moths collected by Mrs. J. S. Hooker at Kirkee, near Poona (1911), were presented by the Rev. J. W. B. Bell, M.A., Hertford College.

One hundred and fifty-six butterflies, 12 moths, and 2 Odonata, S. Jacintho Valley, 7 miles N.E. of Theophilo Ottoni, Minas Geraes, E. Brazil (August, 1907–May, 1908), were presented by the captor, F. Birch, Esq. The specimens are greatly wanted by the Department, in which this interesting part of Brazil is barely represented. The series of specimens belonging to the beautiful Neotropical Nymphaline genus *Catagramma* are very fine. Among the *Pierinae* Dr. Dixey directs attention to 2 *Leucidea brephos*, an interesting form probably allied to *Terias*. Dr. Karl Jordan kindly arranged with the generous donor that these valuable specimens should be presented to the Department.

Two *Salius* and 3 *Pompilus* from Hyéres (March, April, 1911) were presented to the bionomic series by the captor, Dr. T. A. Chapman, M.D., together with examples of the Reduviid bug *Pirates hybridus* from Amélie-les-Bains (April, 1911). The specimens show the resemblance of the black red-banded Hemipteron to a common pattern of the Pompilid group of Fossorial Hymenoptera, as described by the donor in Proc. Ent. Soc., 1911, pp. xxix–xxx.

Dr. Chapman also presented 2 female *Polistes gallicus* with the young comb over which they were resting beneath a stone (Hyères, March 29, 1911). The comb had but 8 cells, 5 of which contained eggs. The association of two females with a nest at this early stage is remarkable (ibid., p. xxx).

Three specimens of *Nomiades arion* from N. Cornwall (July 3–4, 1911), 25 moths from the Forest of Wyre, Worcestershire (April, 1911), and 34 moths from the New Forest (May, June, 1911) were presented to the general collection by the captor, F. C. Woodforde, Esq., B.A., Exeter College.

Four specimens of the Zygaenid moth *Procris geryon*, Dovedale, Derbyshire (June, 1911), were presented by the captor, E. D. Bostock, Esq.

Additions to the British Collections in 1911.

No more interesting and valuable addition to the bionomic series has ever been made than the large collection by which

Mr. A. H. Hamm, of the Hope Department, has thrown so much light upon the courtship of the Empid flies.

Results so surprising require abundant proof, and it will be admitted by any one who studies the series that the material both of *Empidae* themselves and the insects captured or objects seized by them, is of immense extent and most carefully collected, embodying the results of a large number of original observations and most ingenious experiments. The whole of Mr. Hamm's researches were carried out in the neighbourhood of Oxford. The great labour of labelling and cataloguing was finished by Mr. Collins in time for exhibition at the Entomological Congress in August, 1912, where the collection was studied with keen attention and interest. The catalogue numbers—591 in 1908, 771 in 1909, 718 in 1910, and 969 in 1911—large as they are, give a very inadequate idea of the material; for the catalogue is of mounts rather than specimens, of which many are constantly carried on a single card. The collection includes many specimens captured and presented by Mr. Hamm's son, Mr. C. H. Hamm.

A part of the results has been already published in the "Entomologist's Monthly Magazine" for 1908, p. 181, and 1909, pp. 132 and 157; but the most novel and interesting observations and conclusions—those obtained with the genus *Hilara*—are made known for the first time in the following brief account of Mr. Hamm's gift. The full and detailed account awaits publication until numbers of obscure and minute insects—Dipterous captors and prey chiefly Dipterous—have been satisfactorily worked out.

The collection has been classified by Mr. Hamm so as to illustrate his conclusions, the species being arranged in groups, each representing a definite evolutionary stage in the use of prey—first and lowest as food devoured by both sexes without relation to pairing, then as a gift provided by the male and devoured by the female during pairing, finally—as it were an ornament or plaything—no longer eaten by the female, but acting as a lure and a stimulus. In this last stage the prey is often replaced by some vegetable fragment which is quite unsuitable as food. The climax of this line of evolution is

reached in an elaborate cocoon spun by the male around the prey and replacing the latter as an object of attraction. This replacement is self-evident in many examples studied by Mr. Hamm; for in these there was nothing but an empty cocoon, the prey having probably been lost during the process of construction.

There are strong reasons for the belief that the last stage has been reached through the second and the second through the first, but this inference must not be extended further and made to apply to the species themselves.

Empidae and their prey in relation to courtship.

I. Prey devoured by both sexes independently of pairing.

A. *Tachydromia* (*Tachydrominae*). Prey very nearly always Dipterous and often belonging to the genus *Tachydromia*, perhaps sometimes to the same species as the captor. The female *in copula* has very rarely been found with prey. 1908—ninety catalogued specimens (or mounts), of which 17 were captured by Mr. C. H. Hamm; 1909—eighty-six, of which 2 were captured by Mr. C. H. Hamm; 1911—thirty.

B. *Hybos* (*Hybotinae*). Prey generally Hymenopterous. 1908—eighty-four, of which 26 were captured by Mr. C. H. Hamm; 1909—two; 1911—six.

C. *Empis trigramma*, *punctata*, and *scutellata* (*Empinae*). A little group of related species with habits very different from those of the rest of the genus so far as it has been studied. 1909—sixty-three.

II. The prey provided by the male is devoured or sucked by the female during copulation.

A. *Pachymeria* (*Empinae*). The prey always Dipterous. 1908—one hundred and ten; 1909—one hundred and seventy-eight.

B. *Rhamphomyia* (*Empinae*). The prey nearly always Dipterous. 1909—three; 1910—two hundred and fifty; 1911—sixty-five.

C. *Empis* (*Empinae*). Small species as yet undetermined. Prey nearly always minute Diptera, chiefly *Cecidomyia* and *Psychodes*. 1909—two; 1910—fifty-five; 1911—one hundred and three.

D. *Empis tessellata*. Prey very varied, but always Dipterous. 1908—two; 1909—two hundred and twenty-four; 1910—twelve; 1911—thirty-three.

E. *Empis opaca*. Prey like that of *tessellata*, but mainly of the genus *Bibio*. 1909—one hundred and sixty-eight; 1910—forty-six; 1911—forty.

F. *Empis livida*. Prey more varied than that of any other species of the genus, but still chiefly Dipterous. 1908—three hundred and five, of which 4 were collected by Mr. C. H. Hamm; 1909—forty-five; 1911—thirty-two.

III. The prey or object provided by the male is not devoured by the female, but becomes as it were an ornament or plaything providing some indispensable stimulus.

A. *Hilara* (*Empinae*). Many species as yet undetermined. All the species fly over water, and the prey or other object is always picked up from its surface by the male *Hilara*. The males take floating insects of all kinds—sometimes specially Diptera, sometimes Aphids—scales off overhanging trees or other fragments of plants. Some of the species will accept almost any floating object, while others seem to restrict themselves to particular insects, such as *Aphidae*. When the object is very heavy the male, after seizing it, spins round with great velocity till the load rises on a cone of water and is finally lifted from the apex. In Mr. Hamm's experiments disabled Diptera of the genus *Chironomus*, &c., stamens of buttercups, and ray florets of daisies strewn on the water were soon taken by the males and afterwards found in the possession of the females. Pairing invariably occurs upon the wing, but numbers of specimens show that a sweep of the net through the swarm at first catches nothing but males carrying the objects that had been strewn on the water, while a later sweep catches pairs still carrying the same objects. The specimens illustrating this investigation are all carefully

labelled with the hour and minute at which the different samples were secured.

Mr. Hamm's admirable experiments also enabled him to determine that the females carry the objects provided by the males; for although they are never retained when the pairs are captured, the white florets or the yellow stamens can be seen hanging from the lower *Hilara* of each flying pair, and the lower is invariably the female.

The climax is reached in the males of certain species of *Hilara* which envelop the prey or other minute object in a cocoon, varying greatly in complexity, but in the most extreme cases of striking beauty and regularity. The cocoon is spun upon the wing, so that the method of its construction cannot be followed. Captured individuals are often found to have extruded a viscid globule—probably the material out of which the cocoon is spun. There can be little doubt that in these extreme cases it is the cocoon itself which acts as a stimulus to the female, although the minute and almost invisible object usually enclosed in it, but sometimes dropped, is the stimulus which incites the male to spin. Cocoons that have been dropped, probably after pairing, are constantly picked up and used over again by other males.

These novel and surprising conclusions, obtained as the outcome of Mr. Hamm's energy, resource, and power of accurate observation, are illustrated and confirmed by an immense mass of mounted material, catalogued under 355 numbers in 1910 and no less than 660 in 1911.

The collection of British Diptera greatly benefited, as in many previous years, by the generous kindness of Col. J. W. Yerbury, no less than 740 specimens having been catalogued and incorporated. The dates of capture range from 1894 to 1910, and localities from the following counties are represented:—Inverness, Nairnshire, Perthshire and Sutherland, Herefordshire, Gloucestershire, Devon, Dorset, Hampshire, Kent, Surrey, Essex, Suffolk. Many Diptera from a few localities in N. Wales and from Porthcawl in S. Wales are also present. The species belong principally to the *Anthomyidae*, *Sepsidae*, *Geomyzidae*, *Ephydridae*, *Drosophilidae*, and

Agromyzidae. The great majority have been named by J. E. Collin, Esq., and the determinations have been in all cases affixed to the specimens. Col. Yerbury also presented a series of 4 specimens and 3 puparia of the Tipulid *Dictenidia bimaculata*, bred (May, 1910) by Dr. David Sharp, F.R.S., in the New Forest. This fine insect is a very welcome addition to the British Collection.

For the collection of British Hymenoptera Col. Yerbury presented a ♂ and ♀ of *Mutilla europaea* and a ♀ *Pompilus rufipes*, from Studland, Dorset (1910), for the general collection 5 Diptera from Cascaes, Portugal (1896), and for the bionomic collection two Dipterous predaceous insects with Dipterous victims—a ♀ *Caricea tigrina* with a ♀ *Coenosia* (Porthcawl, S. Wales, 1903) and *Ophyra leucostoma*, with prey as yet unnamed (Christchurch, Hampshire, 1897).

The following valuable additions to the British collections are due to the kindness of F. C. Woodforde, Esq., B.A., Exeter College. The specimens, unless otherwise described, were captured or bred by the donor.

One *Asteroscopus nubeculosa*, bred in April, 1911, from eggs laid by a female captured at Rannoch in March, 1908, by L. G. Esson, Esq. The species is apt to remain for some years in the pupal state.

Seventy-seven moths, 1 *Goneptcryx rhamni*, and 1 Dipteron, taken April, 1911, in the Forest of Wyre, Worcestershire. Among the moths is a fine set of *Taeniocampae* taken at Sallow, including *T. opima* and *T. miniosa*.

Six dark forms of *Tephrosia crepuscularia* (*binndularia*), bred May 5, 1911, from a female captured May 28, 1910, at Cannock Chase, Staffordshire.

One dark form of *Boarmia repandata*, bred June, 1911, by B. G. Adams, Esq.

Fifteen butterflies, 170 moths, including fine series of *Boarmia cinctaria*, *Scodiona belgiaria*, and *Pachycnemia hippocastanaria*, 14 Diptera, including *Empis tessellata* and its Dipterous prey *Leptis scolopacea*, 4 Neuroptera and 6 Hymenoptera Parasitica, bred from Lepidoptera, from the New Forest, 1911.

Nine butterflies, including 5 *Nomiades arion*, 37 moths, including 1 ♀ *Agrotis lunigera*, and 20 mixed insects, including a set of the Melolonthid beetle *Rhizotrogus ochraceus*, only recently recaptured and confirmed as British, from N. Cornwall (1911). Two of the moths were bred in N. Cornwall from ova laid by a female captured in the New Forest and 2 from a female taken at Sutton Coldfield.

One *Lycaena* (*Cyaniris*) *argiolus*, May 11, 1911, from Clevedon, Somerset.

A fine collection of British insects of many groups, captured 1909–11 in N. Devon, from several localities, almost exclusively in the neighbourhood of Mortehoe, was presented by the captor, Dr. G. B. Longstaff, D.M., F.R.C.P., New College, Oxford.

The collection is made up of the following:—Hymenoptera, considerably over 113, inasmuch as two or more are often mounted on the same card; Diptera, 327, including a fine series of *Syrphidae*, of which all the difficult or obscure species were determined by the late G. H. Verrall, Esq.; Neuroptera, 5; Coleoptera, over 83; Rhynchota, over 33; Orthoptera, 14. The collection also includes the following specimens for the bionomic series:—5 *Empidae*, with Dipterous prey of the following kinds respectively—an Anthomyid, a Dolichopid, *Siphona geniculata*, *Syrphus ribesii*, *Lucilia caesar*; 1 *Scatophaga stercoraria*, with Dipterous prey; 2 *Tenthredinidae*, one with Dipterous prey, one with Tenthredinid prey; the Tenthredinid *Allantus arcuatus* together with a ♂ humble bee, *Psithyrus barbutellus*, a much larger insect, which it repeatedly tried to drive off a flower-head of Scabious; 2 *Bombus agrorum*, a common humble bee, and 2 *Arctophila mussitans*, a much rarer fly. The bee and fly may be seen together on the same patch of *Centaurea nigra*, although these particular specimens were not so taken.

Three ♂ and 14 ♀ *Clisiocampa castrensis*, bred July 24–31, from larvae found, June 26, mostly on *Statice limonium*, at Rushenden Spit, Queenborough, Sheppey, were presented by Commander J. J. Walker, Hon. M.A., F.E.S. The larvae were subsequently fed on apple at Oxford.

A female *Parasemia plantaginis*, captured June 3 in Tubney Wood near Oxford, together with 9 ♂ and 2 ♀ bred from her eggs, was presented by Commander Walker. The eggs were laid about June 4–8, and hatched about June 14. The larvae were fed on lettuce, and the moths emerged Aug. 26–Oct. 14 (Ent. Mo. Mag., 1911, p. 260).

Nine specimens of the Zygaenid moth *Procris geryon*, Dovedale, Derbyshire (June, 1911), were presented by the captor, E. D. Bostock, Esq.

Ten specimens of the Zygaenid *Z. meliloti*, Wood Fidley, New Forest (July 6, 1911), were presented by the captor, the Rev. G. E. C. Osborne.

A nest of the Dartford Warbler (*Melizophilus provincialis*), taken in a gorse-bush, at Blackheath, Guildford, in 1898, after the flight of the young birds, was presented by Mrs. Alfred Hewitt, who, as Miss Margery Moseley, had made the observation and preserved this evidence of the breeding of the species in England.

Additions to the Collections in 1912.

The following collections have not yet been incorporated, although some of them have been labelled. It is hoped that they will be acknowledged in the next year's Reports:—A collection of butterflies from Trinidad by Guy A. K. Marshall, Esq.; of Insects of many Orders from New Guinea by G. N. Carson, Esq.; of Lepidoptera from Bwaidogo Island at the South-East end of New Guinea by D. Jenness, Esq., B.A., Balliol College; the chief part of the material of his paper (Part II, No. IX) in the Trans. Ent. Soc. 1912, by Lieut.-Col. N. Manders, R.A.M.C., F.Z.S., F.E.S.

A very interesting collection of ants from the neighbourhood of Buluwayo (1911–12) was presented by the captor, G. Arnold, Esq., M.Sc., A.R.C.S., F.E.S., curator of the Rhodesian Museum, Buluwayo. Many of the species are new to science, having been only recently described by Prof. A. Forel. The donor has also presented a few Australian and Californian ants and a few other South African

Aculeates, the latter his own captures. A full account, with the numbers of specimens, will appear in a future Report.

The exceedingly fine and complete collection of British East African butterflies (1905–12), presented by the captor, Rev. K. St. Aubyn Rogers, M.A., Wadham College, has now been catalogued and incorporated. The generous donor gave extremely kind and efficient assistance in this task, by himself undertaking the arrangement of the African *Lycaenidae*, during a visit to Oxford in the summer of 1912. The immense extent of the gift may be inferred from a glance at the following pages, where the collection, although catalogued under the separate years, is acknowledged as a whole. The University Collection now possesses, in consequence of this great gift, one of the finest, if not the finest series of British East African butterflies in any museum. All possess the most excellent data of time and place. A small but valuable collection of moths and of beetles, as well as many specimens of great bionomic interest, are also included.

The localities are arranged in the following order :—(1) The coast district in the neighbourhood of Rabai, 14 miles N.W. of Mombasa ; (2) The Uganda Railway as far as Voi and then diverging to the Hills of Taita, Taveta, and Kilimanjaro ; (3) The Uganda Railway W. from Voi, thus reaching the Nairobi, Fort Hall, and Kenia districts.

Rabai (about 700 ft.), 14 miles N.W. of Mombasa.

1906—fifty butterflies and one moth, including the unique ♀ type of *Pseudacraea rogersi* and the mimetic group represented in figs. 5, 6, 7 of Plate XXIX, Trans. Ent. Soc., 1908. The model *Mylothris agathina* and its two mimics *Belenois thysa* ♀ and *Leuceronia argia* ♀ were captured together on the same day, June 23.

1907—one hundred and twenty-two butterflies, 27 moths, and 1 Asilid fly (*Alcimus*) with its Hesperid prey. The fine series of butterflies includes 4 ♂ *Ps. trimenii*, one of them a var. described by Mr. Roland Trimen, Hon. M.A., F.R.S., in Trans. Ent. Soc., 1908, p. 553, 2 ♂ *Euxanthe tiberius*, 6 ♂ *E. wakefieldi*, 1 ♀ *Eurytphene senegalensis*. 1 ♂ *Acraea satis*

2 ♀ *Alaena picata*, 2 *Lycaenesthes lasti* (capt. *in cop.*), 5 dark forms of *Teriomima freya*, 1 yellow ♀ *Teracolus hetaera*, 1 pair *Ter. regina*, 1 *Pap. kirbyi*, and, for the bionomic series, a Satyrine showing symmetrical injuries of the wings, and several members of the two great E. African black and white groups ranged round the Danaine butterflies *Amauris niavius dominicanus* and *Amauris ochlea* respectively. Two of these are figured in Trans. Ent. Soc., 1908, Pl. XXVI, viz. the model *dominicanus* (fig. 1) and one of the rarest of its mimics *Hypolimnas usambara* (fig. 2). Model and mimic were captured on the same day, Sept. 15.

1908—twenty-five moths and 132 butterflies, including 3 *Physcaenura leda*, 1 *Mycalesis mandanes*, 2♂ *Euxanthe tiberius*, 6 ♂ *E. wakefieldi*, 3 ♂ *Euryphene chriemhilda*, 2 ♂ 2 ♀ *E. senegalensis*, 2 *Hypolimnas usambara*, 1 ♂ 1 ♀ *Charaxes azota*, 1 ♂ *Ps. trimenii* (var.), 1 ♂ 1 ♀ *A. rabbaiae mombasae*, 1 ♂ *A. satis*, 7 *Teriomima subpunctata*, 12 *T. micra*, 5 *Telipna rogersi*, 2 pairs *Pentila amenaida* (capt. *in cop.*), 1♂ *Virachola caerulea*, 1 *Spindasis kallimon*, 1 *Iolaus pallene*, 1 fine yellow ♀ *Belenois thysa*, 3♂ *Pap. dardanus tibullus*. In addition to the above, pupal cases and larval skins and heads of *Charaxes saturnus*, *castor*, and *azota*, together with the following additions to the bionomic series :—two butterflies with injuries probably caused by enemies, 1 Asilid and its prey, an Andrenid bee, 1 *Pardopsis punctatissima* and *Pentila amenaida* captured on the same day, Aug. 15.

1910—one hundred and four butterflies, including 4 ♂ *E. tiberius*, 1 ♀ *E. wakefieldi*, 1♂1 ♀ *Ps. trimenii*, 1 ♂ *Charaxes bohemanni*, 1 ♀ *Ch. boueti lasti*, 1 *Ch. violetta*, 1 *Euryphura achlys*, 1♂ *A. satis*, 2 *Iolaus pallene*, 1 ♀ *Alaena picata*, 3 *Teriomima subpunctata*, 2 *T. micra*, 8 *T. freya*, 2 *Telipna rogersi*, 5 *Pentila peucetia*, 1 *Phrissura nagare*, 3 *Pap. porthaon*, 1 *P. colonna*, 1 *P. constantinus*, 1 *Gorgyra minima*, 1 *Coenides cylindra*, 1 ♂ *Ploetzia cerymica*; 10 moths, including one pair *Cartaletis lybissa* (capt. *in cop.*); 2 Asilid flies with their prey, a ♂ *Catopsilia florella* and a Bombylid fly respectively; also the ♀ parent of the *inaria* form of *Hypolimnas misippus* with

its 35 ♀ offspring, all of which were of the type or *misippus* form—a result that can only be explained by supposing that the *inaria* ♀ parent had paired with a ♂ carrying the tendencies of *misippus* and that *misippus* is a Mendelian dominant. The result of the experiment is published in Proc. Ent. Soc., 1911, p. xliv. The material of an experiment upon a company of larvae of *Belenois severina* is also included, 7 ♂ and 2 ♀ being reared from larvae fed on young leaves, 15 ♂ and 8 ♀ from larvae fed on old leaves; both sets were accidentally starved Sept. 15–17. Those fed on the old leaves grew more slowly than the others and were stunted. A single *Teracolus*, reared (Sept. 6) from a larva fed on old dry leaves, was also included, together with a wild example of the same species for the purpose of comparison.

1911—twenty-four moths, including 1 *Weymeria athene*—an *Agaristid* mimic of *Cartaletis*, 84 butterflies, including 1 ♂ *Charaxes bohemanni*, 7 ♂ 1 ♀ *Ps. trimenii* (the ♂s forming a transition into the western form as regards the absence of the orange subapical bar to the fore wing), 1 pair *Neptidopsis platyptera* (capt. *in cop.*), 2 *Acraea cuva*, 1 *A. zonata*, 1 ♀ *A. satis*, 4 ♂ 1 ♀ *Hypolycaena* sp. near *buxtoni*, 1 *Spindasis kallimon*, 1 *Iolaus lalos*, 1 *Virachola dariaves*, 2 *Teriomima micra*, 1 *T. subpunctata*, 2 *Lycaenesthes adherbal*, 1 pair *Phrissura lasti* (capt. *in cop.*), 1 *Phrissura nagare*, 1 ♂ 1 ♀ *Ter. daira*, 2 *Pap. kirbyi*, 1 ♂ *P. dardanus tibullus*, 1 *Gorgyra johnstoni*. Also an Asilid fly and its prey, a Coreid bug. Furthermore, the specimens from Rabai included 2 ♀ parents of the type form of *Hypolimnas misippus* together with their ♀ offspring—16 all of the type form in one family, 37 of the type form and 17 of the *inaria* form in the other family. These results were published in the Proc. Ent. Soc., 1912, pp. lxxiii–lxxiv. For the bionomic series there were also included 2 *Libythea*, and 2 ♂s and 3 ♀ s of *Crenis*, migrating, March 31, 1911, owing to excessive drought and thus brought into the Rabai district, in which they are not normally found (Proc. Ent. Soc., 1912, pp. xcviii–xcix). Also *Amauris niavius dominicanus* with its mimics *H. wahlbergi* and the *hippocoon* ♀ of *dardanus* captured together May 27; 1 *Amauris ochlea*,

1 *Neptis agatha*, 1 *Ps. lucretia*, 1 ♂ 1 ♀ *H. deceptor*, 1 ♂ 2 ♀ *Enxanthe wakefieldi*, all captured June 17; also 1 ♂ *Acraea natalica*, 1 ♂ *A. acara*, 1 ♂ *Ps. trimenii*, captured April 20; also 1 ♀ *A. anemosa*, 1 ♂ *A. natalica*, 1 ♂ *A. areca*, 1 ♂ *Ps. trimenii*, captured July 1.

1912—fifteen moths, including *Weymeria athene*—a mimic of *Cartaletis*, 35 butterflies, including 2 ♂ *Ps. trimenii*, 1 *A. insignis* (with remarkable reduction of black markings), 1 ♀ *A. satis*, 1 ♀ *A. anbyni*, Eltringham (the type of the description of this sex).

The fine collection of moths, chiefly from the Rabai district, and acknowledged in the preceding paragraphs, includes three new species soon to be described by G. T. Bethune-Baker, Esq., Pres. E. S.

An interesting series of 74 Coleoptera of various groups captured (1908–1911) in the Rabai district was presented by the same generous donor. The following additional specimens with the same data have been placed in the bionomic series:—2 Coccinellid beetles of the genus *Epilachna* and 2 Pentatomid bugs with a similar pattern, 1 ♀ Mutillid and 1 Clerid beetle mimicking it in a very remarkable manner. The black abdomen of the stinging model is marked with two pairs of white spots, of which the anterior is bright and glistening, the posterior dull. The elytra of the beetle are also marked by two pairs of spots bearing the same relative brightness and so placed that they appear to occupy positions corresponding to those of the model.

Shimba (about 1,200 ft.), about 16 miles W. of Mombasa: 1907—twelve butterflies, including the unique ♂ type of *Psendacraea rogersi*, Trimen, 1 ♂ *Enptera kimgnana*, 1 very black form of ♀ *Acraea natalica*, and 1 *Argiolaus lalos*.

Kisimani (about 500 ft.), 3 miles S.W. of Rabai, woodland and cocoa plantations: 1910—two *Hesperidae*, and, for the bionomic collection, 1 *Amauris niavius*, 1 *Hypolimnas wahlbergi*, 1 ♀ *Enxanthe wakefieldi*, 1 ♂ *P. dardanus tibullus*, all captured Sept. 17.

Changombe (about 600 ft.). 3 miles E.N.E. of Rabai, wood-

land: 1910—three *Pentila micra*, 1 ♀ *Lycaenesthes lemnos*, and 10 *Hesperidae*, especially needed by the Department.

Jimba (about 700 ft.), about 3 miles N.N.W. of Rabai: 1907—four butterflies; 1908—one ♂ *Teraeolus daira*; 1909—eleven *Pierinae* (10 *Ter. daira*), an Asilid fly and its prey a dragon-fly; 1911—five butterflies.

Kaloleni (about 900 ft.), about 10 miles N. of Rabai: 1906—one *Aeraea*; 1912—one *Petovia dichroaria* (*Geometridae*).

Kaya Kambi (about 600 ft.), about 12 miles N. of Rabai: 1906—one ♀ *Euxanthe tiberius* and 1 moth *Pitthea famula*.

Jibana (about 600 ft.), about 14 miles N. of Rabai: 1906—one ♀ *Pinaeopteryx spilleri*.

Chalani (about 600 ft.), about 15 miles N. of Rabai: 1906—one *Acraea insignis*: 1908—one ♂ *Charaxes violetta*; 1911—one ♂ *Charaxes etheoeles*, 1 *Epamera*, 1 *Pinacopteryx*.

Chonyi (about 400 ft.), about 15 miles N.E. of Rabai: 1908—eight butterflies.

Weruni (about 700 ft.), about 20 miles N. of Rabai: 1911—one fine ♂ *Argiolaus silas*, var. *lalos*.

Ndzovuni (about 300–600 ft.), about 25 miles N. of Rabai; dense forest: 1906—one moth and 27 butterflies, including 2 ♂ *Acraea cuva*, 1 *A. rabbaiae mombasae*, 1 ♀ *Pseudaeraea trimenii*, 1 ♀ *Epamera mermis*, 1 *Teracolus hetaera* (white form), 1 pair *Plirissura lasti* (capt. *in cop.*), 1 pair *Belenois thysa* (capt. *in cop.*), 1 *Rhopaloeampta sejuncta*: 1907—six butterflies, including 2 *Pentila peueetia*, and the Geometrid moth *Paraptyehodes tenuis*: 1908—one moth and 18 butterflies, including 1 ♀ *Aterica galene* with fulvous patch on hind wing, 1 *A. satis*, 1 *A. rabbaiae mombasae*, 1 ♀ f. *hippoeoon* of *P. dardanus tibullus*, 1 *Parosmodes moranti*, 1 *Rhopalocampta keithloa*: 1910—six butterflies, including 1 ♂ *Charaxes lasti* and 2 *Pentila rogersi*: 1911—one moth, the type of a new species of *Paraptychodes* (*Geometridae*), soon to be described by Mr. L. B. Prout, F.E.S., and 39 butterflies, including one pair *Physcaenura leda* (capt. *in cop.*), 2 *Neptis trigonophora*, 2 *Ps. trimenii* (1 with hardly any subapical ochreous bar to the fore wing), 1 ♂ 1 ♀ *Charaxes azota*, 1 ♂ 2 ♀ *Ch. cithaeron*, 1 ♂ *Ch. pithodorus*, 3 ♂ 2 ♀ *Ch. lasti*, 2 *Euphaedra eleus*, 1 ♂ *Aeraea*

satis, 1 ♀ *Iolaus mermis*, 3 ♂ 1 ♀ *Alaena picata* (specimens which proved for the first time that these two butterflies with entirely different upper-side pattern are the sexes of the same species. The ♂ had been independently described by Suffert, in 1904, as *Al. rollei*, which now sinks to *picata*, described by Miss E. M. Sharpe in 1896), 1 ♀ *Ter. eris* (an unusual yellow form), 1 ♀ form *hippocoon* of *P. dardanus*, 1 *P. constantinus*, 1 *Caprona pillaana*, also one Asilid fly (*Alcimus*) and its prey, a *Teracolus*: 1912—one *Euryphene chriemhilda*, 1 *Euryphura achlys*, 1 ♂ *A. satis*.

Godoma (about 400–500 ft.), about 30 miles N. of Rabai, some forest: 1909—one *Deloneura ochrascens* and 1 *Teriomima micra*: 1911—one *Pentila amenaida*.

Kaya Kauma (about 500 ft.), about 35 miles N. of Rabai: 1906—one moth and 10 butterflies, including 1 *Teriomima subpunctata* and 1 *Papilio colonna*: 1907—five butterflies: 1908—eight butterflies, including 1 ♀ *Aterica galene* with rich orange-brown patch on hind wing, 1 ♀ f. *niobe* of *P. dardanus tibullus* (the markings ochreous rather than fulvous), 1 *Iolaus lalos*: 1912—one ♂ 1 ♀ *Acraea braesia*.

Mwaeba Hill (about 700 ft.), about 35 miles N.N.W. of Rabai: 1906—nine butterflies, including 2 Acraeas of a new species recently described by Mr. Eltringham, M.A., New College, F.E.S., as *A. aubyni*, 1 *A. rabbaiae mombasae*: 1907—seven butterflies, including the ♂ type of *Acraea aubyni*, Eltringham.

Giryama Country (500–700 ft.), about 45 miles N. of Rabai: 1906—seven butterflies, including 1 *Hypolimnas deceptor*, 3 *Pseudacraea lucretia*, and 1 *Acraea rabbaiae mombasae*: 1908—1 *Iolaus lalos*, 1 *Deloneura ochrascens*, 1 *Acraea zonata*.

Mleji (500–700 ft.), about 45 miles N. of Rabai: 1906—one *Acraea*: 1909—a *Mantis* with its prey, a wasp.

Vitengeni (about 400 ft.), about 50 miles N. of Rabai: 1911—one *Deloneura ochrascens*, 1 *Pentila amenaida*.

Dida Forest (about 500 ft.), Giryama Country, about 55 miles N. of Rabai: 1906—nine butterflies: 1908—1 *Ps. lucretia* and 2 ♂ *H. deceptor*, captured on the same day, Aug. 20; 1910—one ♀ *Acraea satis* and 1 Lycaenid.

Mangea (about 500 ft.), about 75 miles N. of Mombasa: 1906—twelve butterflies, including 2 ♂ *Epamera mermis*, and the following 5 members of two principal black-and-white groups captured July 17–19:—3 *Pseudacraca lucretia*, 1 *Hypolimnas deceptor*, 1 *Hypolimnas wahlbergi*.

Jilore (about 200 ft.), Sabaki River, about 80 miles N. of Mombasa and 19 W. of Malindi, forest and cultivated ground: 1906—twenty-seven butterflies, including 2 pairs of *Pinacopteryx spilleri*, 1 *Iolaus pallene*, and 1 *H. deceptor*: 1908—ten butterflies, including 1 ♀ *Ter. hetaera*, 1 ♀ *Pinacopt. liliana*: 1910—five butterflies, including 1 *Charaxes tavetensis* bred (March 7, 1910) from larva found at this locality; this species is new to the Hope Department, and has probably never been bred before: 1911—one moth and 16 butterflies, including 1 *Virachola dinocharcs*, 2 *Teriomima micra*, 4 *Teracolus daira*: 1912—one *Neptidopsis platyptera*, 1 *Hypolycaena*, 1 ♂ *Teracolus*.

Kaembeni (about 300 ft.), forest, about 20 miles S. of Jilore: 1908—two *Picrinae*: 1910—three fine *Teracolus protomedia*: 1911—one *Neptis*, 1 pair *Epamera mermis* (capt. *in cop.*).

Sokoki (about 200–300 ft.), open forest extending 20–30 miles S. from the Jilore–Malindi Road: 1908—seven butterflies, including 1 *Iolaus lalos*, 1 pair *Pinacopteryx liliana* (capt. *in cop.*), and, for the bionomic series, 1 *Pard. punctatissima* and 1 *Pentila amenaida* taken on the same day, August 24: 1909—one *Charaxes jahlusa*, 1 Geometrid moth: 1910—two *Lycaenidae*: 1911—thirteen butterflies, including 6 *Chloroselas pseudozeritis*: 1912—one very interesting dark variety of *Pap. philonoe*, 1 Hesperid.

Between Jilore and Malindi (probably much less than 100 ft.), forest: 1910—one ♀ f. *planemoides* of *Pap. dardanus*, captured by a native collector in August. This interesting specimen, of which the pattern exhibits certain ancestral features, is described in Proc. Ent. Soc., 1911, pp. xlii–xliv: 1911—two *Neptis*, 1 ♀ *Ps. trimenii* (thick woodland, about 100–200 ft.).

Mida (just above sea-level), about 15 miles S. of Malindi: 1912—one *Charaxes jahlusa*.

Mida-Roka (just above sea-level), about 12 miles S.W. of Mida: 1912—one fine ♂ *Virachola dinochares*.

Mtanganyiko (about 100 ft.), Kilifii Creek, S. of Malindi: 1912—one *Teracolus*.

Galana (about 100–200 ft.), about 80 miles from Rabai, N. of Sabaki River: 1911—one *Acraca damii cuva*, 6 *Dcloneura ochrascens*, all of which flew out of the same tree.

Mombasa Island (just above sea-level): 1906—twenty-four butterflies, including the *albinus* form of *D. chrysippus*, 1 *Teriomima freya*, and a long series of *Pinacopteryx liliana*.

Mazeras (about 500 ft.), 12 miles N.W. of Mombasa: 1906—four butterflies, including 1 ♀ *Euxanthe wakefieldi*, 1 ♀ *Teracolus hetaera* (yellow form), and 1 *T. protomedia*.

Mackinnon Rd., about 60 miles N.W. of Mombasa: 1905—one *Acraca chilo*.

Voi Swamp (1,800 ft.), near Voi Station: 1909—six butterflies, including 1 ♂ *D. chrysippus* f. *albinus*, and 4 ♀ *A. chilo*: 1911—seven butterflies, including 5 forms of *Acraea encedon* and 1 *A. braesia*. Voi: low woodland about 1,830 ft.: 1912—one ♀ *A. equatorialis anacmia*, 1 Hesperid.

Voi Plain (about 2,000 feet), 7 miles N. of Voi Station: 1908—one *Tarucus louisae*: 1909 (at about 1,900 feet)—eight butterflies, including 2 pairs of *A. chilo*, 1 pair *Teracolus aurigineus* (capt. *in cop.*): 1911—one *Acraea equatorialis anaemia*, Eltringham (a new sub-species described in Mr. Eltringham's great monograph), 1 ♀ *A. acrita*.

Voi River (about 2,000 ft.), 7 miles W. of Voi Station, mile 100 on Uganda Railway: 1905—four butterflies, including a male *Papilio dardanus tibullus* and one *Hypolimnas wahlbergi*: 1906—three butterflies, including 1 *Pentila pencetia* and 1 wet-season form of *Precis simia* captured in the midst of a normal dry season, but in this year the rains were more than a month early: 1908—eleven butterflies, including 1 *Castalius melaena*, 1 *Tarucus louisae*, 1 *Lcuceronia buqueti*, 1 ♂ 1 ♀ *Teracolus callidia*, 1 *Herpaenia eriphia*, 1 pair *Pinacopt. liliana* (capt. *in cop.*): 1909—one ♀ *A. chilo*: 1910—six butterflies, including 2 ♂ *Acraca bracsia regalis*,

1 ♀ *Chloroselas pseudozeritis*: 1912—two *Teracolus*, 1 Asilid fly (*Alcimus*) with its prey, a ♂ *Belenois*.

Mwatete (about 2,800 ft.), about 15 miles W. of Voi: 1910—one *Teracolus*.

Taita (about 3,000 ft.), about 100 miles N.W. of Mombasa: 1905—five butterflies, including 1 *Precis simia*.

Taita Plain (about 1,800–2,000 ft.): 1912—one ♀ *A. equatorialis anaemia*.

Sagalla Mountain (about 3,500 ft.), Taita: 1909—one *Flata* (Homoptera) and 8 butterflies, including 1 ♀ *Acraca chilo*, 1 pair *Teracolus incretus* (capt. *in cop.*): 1910—the ♀ parent and two offspring, *Precis limnoria*.

Silalonc (about 2,000 ft.), at the foot of Sagalla Mountain: 1911—one ♀ *Spalgis lemolea*.

Dabida (about 5,000 ft.), about 100 miles N.W. of Mombasa: 1905—seven butterflies, including 1 ♂ *Papilio echerioides*, 1 ♀ *Mylothris narcissus*: 1908—one Braconid and 9 butterflies, including 1 ♂ *Acraea johnstoni*, 1 *Catochrysops osiris*, 1 ♀ *Teracolus callidia*: 1910—one ♀ *Acraea johnstoni* f. *confusa* (about 3,700 ft.): 1912—one *Charaxes hansalii baringana* (about 3,700 ft.).

Kaya (about 3,300 ft.), Dabida Hills: 1911—one ♀ *Acraea johnstoni* f. *confusa*.

Wusi (about 4,200 ft.), in the centre of the Dabida Hills: 1906—one ♂ *Pap. echerioides* and 1 Hesperid: 1908—one moth and 11 butterflies, including 3 *Precis aurorina*, 4 ♂ *A. johnstoni* (1 the var. *semifulvescens*), 1 ♂ 1 ♀ *Uranothauma falkensteinii*: 1911—one moth and 5 butterflies, including 1 *Precis limnoria*, and 2 bred *Charaxes pollux*: 1912—one *A. equatorialis anaemia*, 1 Hesperid.

Kidaya (about 5,000 ft.), Dabida Hills, open country and woodland: 1911—twenty-two butterflies, including a fine series of *Belenois margaritacea*, 2 ♂ *P. echerioides*, 1 *P. menestheus*, 2 *Neptis incongrua*, 1 *Precis aurorina*.

Chawia (about 5,000 ft.), in the centre of the Dabida Hills, forest and native clearings: 1908—seven butterflies, including 1 *Rapala* sp. very near to *dariaves*, 1 *Cyclopides metis*, 1 *Pap. philonoe*: 1911—twenty-seven butterflies, including 1 *Salamis*

cacta, 4 *Neptis incongrua*, 1 ♀ *Pap. echerioides* (an interesting form with very pale hind-wing patch), 2 *Gorgyra johnstoni*, 2 *Cyclopides metis*, and, for the bionomic series, 1 *Eurytela hiarbas* and 1 *N. incongrua* captured on the same day, Feb. 16: 1912—twenty butterflies, including a fine series of *Belenois margaritacea*, 3 ♂ *Uranothauma nubifer*, 2 ♂ *P. echerioides*, 2 *Mylothris narcissus*.

Ndegwa's (about 6,000 ft.), Dabida Hills:—1909—two *Brenthis hanningtoni*, 1 pair *Belenois mesentina* (capt. *in cop.*), an Asilid fly and its prey, a bee.

Ngangao (about 6,000 ft.), the forested peak of the Dabida Hills: 1912—thirteen butterflies, including 1 ♀ *Harma* (apparently a new species allied to *H. alcimeda*), 1 *Acraea baxteri* (extending the range of this species), 2 *Uranothauma falkensteinii* (capt. *in cop.*).

Burra (about 3,000 ft.), W. end of Dabida Hills: 1910—2 *Teracolus*, 1 *Pinacopteryx*.

Maketao (about 3,800 ft.), between Taveta and Burra: 1905—eleven butterflies, including 3 examples of *Precis simia*—1 dry-season form and 1 intermediate, taken May 25, and 1 wet-season form, June 13: 1910—three butterflies, including 1 ♀ *Charaxes etheocles* (about 3,700 ft.).

Lanjoro (about 3,000 ft.), 10 m. E. of Taveta: 1905—one Pierine.

Voi to Taveta (2,000 ft.): 1905—twenty-four butterflies, including 4 ♂ and 1 ♀ of *Acraea braesia*.

Taveta (about 2,500 ft.): 1905—sixteen butterflies, including 2 *Hesperidae* mimetic, on the under surface, of an *Acraea*, and one Geometrid moth *Petovia dichroaria* mimicking a Lycaenid: 1906—one moth and 66 butterflies, including a fine series of *Spindasis tavetensis*, 1 ♂ *Leuceronia buqueti*, 1 ♀ *Teracolus phlegyas*, and also 1 ♂ *Acraea natalica*, with the left hind wing wanting: 1910—sixteen butterflies, including one pair *Pinacopt. liliana* (capt. *in cop.*). Also 1 Asilid fly (*Alcimus*) and its prey, a butterfly (*Pinacopteryx*).

Kilimanjaro, S.E. slopes (about 3,500 ft.), Samanga: 1905—two *Acraeinae*: slopes 1906 — sixty-one butterflies and 3 moths.

Kiu (about 4,800 ft.), mile 165 on Uganda Railway: 1908—six butterflies, including 3 *Teriomima freya*: 1909—two *Teracolus*.

Masongalene (2,900 ft.), mile 185 on Uganda Railway: 1909—three butterflies, including a curious form of *Acraea esebria*: 1911—sixteen butterflies, including 1 *Acraea cerasa*, 1 ♀ *Ter. bacchus*, 1 ♂ 1 ♀ *T. puniceus*, and 1 *Kedestes callicles*.

Mukaa Hills (about 5,800 ft.), about 30 miles E. of Machakos: 1909—five moths and 67 butterflies, including 11 worn wet-season and 1 fresh dry-season f. of *Precis sesamus*, 1 *Charaxes hansali baringana*, 8 *Acraea astrigera*, 3 ♀ *A. caecilia*, and 2 *A. insignis*.

Kibwezi (about 3,000 ft.), mile 195 on Uganda Railway: 1911—one wet-season form of *Precis simia*.

Limoru (about 7,300 ft.), mile 350 on Uganda Railway: 1909—eleven butterflies, including 1 ♀ *Acraea ansorgei*, 2 *Castalius margaritaceus*, 1 *Pap. mackinnoni*: 1910—nine butterflies, including 2 *Pap. mackinnoni*.

Kijabe Forest (about 7,000 ft.), on Uganda Railway, Kikuyu Country: 1907—two moths and 72 butterflies, including a fine series of *Uranothauma cordatus*, 1 ♀ *Epamera sidus*, many *Mylothris neumanni*, showing much variation, 5 *Pap. mackinnoni*, 3 ♂ 4 ♀ *P. jacksoni*, 1 *P. bromius chrapkowski*, and, for the bionomic series, 1 *D. chrysippus* f. *dorippus* and 1 ♀ *Precis westermanni*, taken respectively Aug. 3 and Aug. 6, 1906: 1909—three *Pierinae* and 1 ♀ *Pap. jacksoni*.

Nairobi (about 5,500 ft.): 1907—fifty-one butterflies, including 1 *Tirumala formosa*, 4 *Mycalesis mandanes*, 1 *Acraea johnstoni* f. *semifulvescens*, 4 *Castalius margaritaceus*, 1 *C. gregorii*, and, for the bionomic series, several members of the mimetic group with *Amauris albimaculata* as its centre, viz. *Papilio dardanus* ♀ f. *cenea*, ♀ *P. jacksoni*, and ♀ *P. echerioides*. These examples include the originals of all the figures except No. 4 on Plate XXVIII in Trans. Ent. Soc., 1908: 1908—one moth and 56 butterflies, including 1 ♂ *Mycalesis mandanes*, 7 ♂ *Lachnoptera ayresi*, 10 *Acraea orestia* (1 pair capt. *in cop.*), 1 *Castalius margaritaceus*, 13 *Phrissura isokani* (2 pairs capt. *in cop.*), 1 ♂ 3 ♀ *Pap. phoreas*, 1 ♂, 1 *trimeni* ♀ f. (very

large), 1 *cenea* ♀ f. of *Pap. dardanus*, 3 *Rhopalocampta unicolor*, 1 *Celaenorrhinus bettoni*: 1909—two moths and 14 butterflies, including 1 *Castalius margaritaceus* and 1 *Pap. nobilis*: 1911—twenty-four butterflies, including 1 *Pap. nobilis*, 1 *Acraea cerasa*, 5 *Lycaenesthes lemnos*, 1 *Precis aurorina*.

Kabeti (about 6,400 ft.), about 8 miles N.W. of Nairobi: 1907—six butterflies, including 1 *Cupido stellata*: 1909—one *Teracolus*.

Between Thika River and Nairobi (about 5,000 ft.), on the Fort Hall road: 1907—ten butterflies.

Thika River (about 5,500 ft.), about 30 miles N. of Nairobi on the road to Fort Hall: 1907—six butterflies.

Kikuyu (about 5,000–6,000 ft.), about 30 miles N. of Nairobi: 1907—one butterfly; 1909—(6,700 ft.) sixteen butterflies, including 2 ♀ *Precis westermanni*, and 1 ♀ *Pap. jacksoni*; 1911—eight butterflies, including 1 *Pap. nobilis* and 1 *P. phorcas*.

Thiba River (about 4,200 ft.), between Embu and Fort Hall: 1909—four *Pierinae*.

Tana River (about 4,000 ft.), on the Fort Hall to Embu Road: 1911—four butterflies.

Tuso (8,000 ft.), about 25 miles W. of Fort Hall: 1907—eight butterflies, including 1 *Neptis incongrua*, 1 *N. woodwardi*, and 1 ♂ *Mylothris neumanni*; 1909—one *Neptis woodwardi* (about 7,000 ft.).

Mogoiri (about 8,000 ft.), 15 to 25 miles W. of Fort Hall: 1907—one moth and 26 butterflies, including 2 *Neptis woodwardi*, 3 *Brenthis hanningtoni*, 2 ♂ *Teracolus elgoensis*, 3 ♂ 1 ♀ *Mylothris neumanni*: 1909—one ♂ *A. asboloplintha rubescens*, 1 *Epamera arborifera* (about 6,500 ft.).

Weithaga (about 6,000 ft.), 15 miles W. of Fort Hall: 1907—seventy-seven moths and 340 butterflies, including 1 *T. formosa*, 6 dry-season, 1 intermediate and 18 wet-season *Precis sesamus*, 7 bred *Precis archesia* (2 from eggs found on food-plant, 5 from eggs laid by a parent which escaped), types and paratypes of ♀ forms *cabiroides*, Poulton, and *tenelloides*, Poulton, of *Acraea alicia*, and a remarkable dark variety of ♂ *alicia*, type and paratypes of *A. asboloplintha rubescens*, Trimen, 5 of the E. f. of *A. pharsalus*, a fine series of ♂ and

♀ *Phylaria heritsia* and of *Cupido stellata*. The fine collection from Weithaga also included 7 of the Tachinid parasites (*Blepharipoda* sp.) which emerged from 9 out of 10 pupae of *D. chrysippus*, and an Asilid with its prey, a Muscid fly: 1908—one *Charaxes pollux*: 1909—one moth and 18 butterflies, including 2 ♂ *A. asboloplintha rubescens*: 1911—two *Hesperidae*.

Ngondo River (5,000 ft.), about 6 miles N. of Weithaga: 1909—nine butterflies, including 1 ♀ *Precis westermanni*, 5 ♂ 2 ♀ *Acraea lycoa kenia*, Eltringham.

Matthioya River (about 4,100 ft.), about 15 miles W. of Fort Hall: 1909—one *Pap. leonidas*: 1911—one *Pardopsis punctatissima* (about 5,000 ft.).

Mt. Kenia (6,500 ft.), forest on S.W. slopes of: 1909—six butterflies, including 1 ♂ 1 ♀ *A. asboloplintha rubescens*, 1 *Charaxes cupale*, and 1 *Castalius margaritaccus*: 1911—five butterflies, including 2 *Mycalesis dentata* and 2 *Hesperidae* (about 6,000 ft.).

Embu (about 6,000 ft.), S.E. slopes of Mt. Kenia, cultivated ground: 1911—nine butterflies, including 1 dry-season *Precis sesamus*, 1 *Acraea asboloplintha rubescens*, 2 ♂ 1 ♀ *A. uvui*, 3 *Lachnocnema*.

Near Embu (4,000–4,400 ft.), 30 miles N. of Fort Hall: 1909—ten butterflies, including 1 ♀ *A. asboloplintha rubescens*.

Thiririka River (about 6,000 ft.), S. of Mt. Kenia: 1911—1 pair *Pinacopteryx* (capt. *in cop.*).

Aberdare Mountains (7,500–8,200 ft.), in forest: 1909—2 *Acraea baxteri*, 1 *Mylothris narcissus*.

Kinangop (11,000 ft.), Aberdare Mountains: 1909—1 African f. of *Apis mellifica* and 7 butterflies, including 2 *Acraea excelsior* and 1 white ♀ of *Colias electra*.

Kinangop (about 8,500 ft.), S. side of: 1907—two moths and twenty-five butterflies, including 3 *Brenthis hanningtoni*, 4 *Antanartia abyssinica*, and 2 *A. excelsior*.

Kinangop (8,500 ft.), bamboo forest on S.E. slope of: 1907—nine butterflies.

Kinangop, plain S. of (about 8,500 ft.): 1907—seventeen butterflies, including 10 *Brenthis hanningtoni* and 2 *Acraea excelsior*.

Maragwe River (about 7,000 ft.), about 10 miles E. of Kinangop: 1907—one *Uranothamma mbifer* and 1 *H. abbotti*: 1909—two *Planema quadricolor* and 1 *H. abbotti*.

Dr. Dixey has made the following notes on some of the most interesting species in the fine series of British East African *Pierinae* in the above collection.

Pinacopteryx liliana. A good specimen of the somewhat unusual yellow form of the female.

Pinacopteryx simana. There is a good deal of confusion about this species, which is quite distinct from *P. liliana*, though often mixed up with it in collections. There is no *P. simana* ♀, identified as such, in Coll. Brit. Mus. Godart's type of *P. doxo*, which has been supposed to be identical with *P. venata*, Butl., is probably a pale specimen of *P. simana* ♀.

Teracolus elgonensis. A fine series of a remarkable and not very common species of *Teracolus*.

Teracolus daira. These are of the deeply-marked E. African form, *T. heuglini*, sometimes ranked as a distinct species.

Teracolus celimene. A link between the "purple-tips" of Africa and the black-and-yellow *T. protomedia* of N.E. Africa and Arabia.

Mylothris narcissus. An interesting form of the protected genus *Mylothris*. This species represents *M. trimenia* of S. Africa, and serves as a model for *Phrissura lasti*.

Belenois margaritacea. This species, with the closely-allied *B. raffrayi*, though belonging to the family of "Whites", shows, in the resting position, nothing but a uniform black.

The following relatively small, but important, part of the very fine collection from the Lagos District, presented by W. A. Lamborn, Esq., has been catalogued and incorporated:—

(1) Two families of *Hypolimnas dinarcha*, together with their female parents, captured, March 27 and 29, 1912, in the forest E. of Oni Camp. One family consisted of 76 ♂ and 61 ♀, the other of 26 ♂ and 46 ♀ offspring. There was distinct evidence of the inheritance of certain slight differences between the patterns of the two parents. The precise pupa-cases are

placed beside the 13 individuals of the first family to which they belong. This is the first time that the species has been bred, and the form of the pupa is of much interest, indicating affinity with *H. salmacis* and *monteironis* rather than with *dubia* and *wahlbergi*. The long series of bred females of a species rather rare in collections also establishes the fact that this sex is non-mimetic and the male mimetic on the W. coast, while in Uganda both sexes are mimetic and alike, with a pattern rather different from that of the West, and corresponding to the presence of different Danaine models.

(2) Thirteen families of *Hypolimnas* (*Euralia*) *dubia* and *anthedon*, with their female parents, captured Feb.–June, 1912, in the forest E. of Oni. These families, with the 7 others bred by Mr. Lamborn in the previous year, first proved that *anthedon* and all the forms of *dubia* are a single species with individuals split up into various patterns mimicking four different Danaine species in their locality. Of the 1912 parents 8 were *dubia*, and their offspring as well as those of 3 *anthedon* always included both *anthedon* and *dubia*: the 2 remaining *anthedon* produced *anthedon* only. The numerical proportion as well as the fact that a single ♀ *anthedon* (in 1911) produced only *dubia*, leaves no doubt that *dubia* is dominant and *anthedon* recessive. Although this conclusion seems to be established, some of the results obtained in the course of these experiments appear to be inexplicable under any existing hypothesis. The total number of catalogued specimens, including several pupae, is 787.

(3) Ten families of *Hypolimnas misippus*, of which all the females and a few of the males have been catalogued—262 specimens in all. The females of this species are dimorphic on the W. coast, appearing as the type form *misippus* and the form *inaria*. Mr. Lamborn's results show that *misippus* is dominant, *inaria* recessive, thus confirming the work of the Rev. K. St. Aubyn Rogers on the E. coast (see p. 955).

A complete analysis of the Oni families, to be published at no distant date, will furnish far more detailed information concerning the hereditary relationships than has been as yet obtained in this species.

(4) Six families of Nymphaline butterflies, together with the female parents. The total number of specimens catalogued is 172. The species are *Ergolis actisanes* (one family), *Enphaedra medou* (two), and *Harma* (*Cynothöe*) *theobene* (three). Mr. Lamborn is probably the first naturalist who has succeeded in breeding these species, and it is certainly the first time that complete families with their parent have been seen. *H. theobene* is especially interesting because of the light thrown upon the dimorphism of the females in the Lagos district. Many pupa-cases and larval skins are included.

A valuable series of butterflies from various localities in Sierra Leone, chiefly from the neighbourhood of Freetown, were presented by C. A. Foster, Esq., of the W. African Regiment. Now that the specimens from the West coast of Africa are increasing so rapidly in the University Collection, these Sierra Leone examples with excellent data are most welcome. Of the specimens 147 were captured in 1910 at Regent, about 3 miles S.E. of Freetown, 49 in 1911 in various localities, chiefly Wilberforce, near Regent, and 8 in 1912, chiefly at Mabanta (about 100 ft.), about 50 miles N. of Freetown. These latter include 2 *Hesperidae* probably undescribed. The 1910 series is especially rich in the fine Nymphaline genera *Charaxes* and *Euphaedra* and its allies. The specimens are catalogued under the three years, but it is convenient to acknowledge the collection as a whole under 1912.

Of Dr. Longstaff's fine collection of insects of many Orders from the Sûdan (1912), only the butterflies and the Hymenoptera have been catalogued and incorporated. Some of the groups are still being studied. The series of butterflies contained 782 specimens, of which the following are of much interest:—20 *Danaida chrysippus* of all forms, including 2 *albinus*; 6 *Hypolimnas misippus*, 3 ♀ being of the type form and 1 ♀ intermediate; 77 *Lycaenidae*, including a fine series of *Catochrysops eleusis* and 1 *Hypolycaena philippus*. The great feature of the collection was the large number (641) of *Pieriuae*, and especially the species of the genus *Teracolus*, which included the following—*protomedia*, *eris*, *eupompe*, *achiue*,

daira, *evarne*, *evippe*, *phlegyas*, *evagore*, *ephyia*, *liagore*, *pleione*, *halimede*, *chrysonome*. The most remarkable single species of Pierine was *Calopieris eulimene*. The series contained 28 examples of this very local species, exceedingly rare in collections.

Dr. Longstaff's fine set of Sûdan Hymenoptera (1912) included 191 Fossores, 51 Diploptera, 162 Anthophila, and 40 Chrysids, all of which have been kindly determined by the Rev. F. D. Morice, M.A., F.E.S., Queen's College.

The following Acraeine butterflies were presented by the Hon. W. Rothschild, F.R.S. :—1 *Acraea moluccana meyeri* from Owgarra, Upper Aroa River, British New Guinea (A. S. Meek) ; also, from Angola and the Congo State,—1 *A. pelopeia*, 2 *penelope*, 1 *servona reversa*, 3 *acrita bellona*, 1 *stenobaea*, 1 *anacreon speciosa*. All these Acraeas were very much wanted in the University Collection.

A *trophonius* female of *Papilio dardanus*, Durban (July 5, 1912), was presented by the captor, G. F. Leigh, Esq., F.E.S. Twenty-seven eggs were laid July 6–7, and the offspring were—2 *hippocoon*, 4 *trophonius*, 1 *leighi*, 9 *cenea*, and 11 males. (Proc. Ent. Soc., 1912, p. cxxxiv.)

A splendid set of 122 *Acraeinae* from Madagascar was presented by M. Charles Oberthür of Rennes. The dates and localities are detailed and precise. This gift, added to M. Oberthür's generous donation in 1911, renders the Hope Collection of Madagascar Acraeas one of the finest in this country. Among the species the following are of special interest—*A. igati*, *damii*, *hova* (a ♂ and ♀ of this splendid species—the largest Ethiopian *Acraea*—new to the Collection), *fornax*, *strattipocles*, *masamba*, *sambavae*, and *ranavalona*.

A female specimen of the rare *Acraea igati* (Madagascar) was presented by Herr F. Wichgraf of Berlin.

Two dragon-flies and 81 Lepidoptera from the neighbourhood of Ambatoharanana, Central Madagascar (1907–11), were presented by the captor, Rev. J. U. Yonge, M.A., Keble College. The moths include 7 *Urania rhipheus*, and the butterflies a beautiful example of *Papilio antenor* (Oct. 8, 1907), very rare in the district, and 1 *Acraea damii*.

Ninety-nine butterflies and 11 moths from the Eastern side of Madagascar were also presented by the same kind donor. The majority of these were captured on the journey from Andevoranto to Ambinanindrano, in the neighbourhood of the latter locality, and beyond it on the journey to Ambatoharanana. The series included some fine species very much wanted by the Collection, captured by the Rev. G. K. K. Cornish, M.A., and given by him to the donor:—*Euxanthe madagascariensis*, *Pseudacraea imerina*, *Charaxes ctesipe cacuthis* ♀ (new to the Collection), *Neptis kikideli*, *Salamis antcva*, *Precis eurodoce*, &c. An interesting specimen of *Aterica rabena* with the right forewing shorn has been added to the bionomic collection. The Hope Department is poor in species from Madagascar (except in the *Acraeinae*), and the gift of these specimens with excellent data of time and place is very welcome.

The following butterflies, most of which were greatly wanted by the Department, were presented by J. J. Joicey, Esq., F.E.S. :—

Africa.—2 *Acraea amicitiae* from Toro, Uganda Protectorate (Coll., F. J. Jackson), and 1 *Charaxes antamboulu* from Madagascar. The *Acraea* is new to the Collection.

Oriental Region.—37 butterflies, including 2 from Aru Islands (the Erycinid *Abisara segecia*, new to the Collection), and 24 from New Guinea, mostly from the N. and N.W., collected by C. and F. Pratt. Among the Papuan species are 2 *Acraea meyeri*, 2 *Apaturina*, 1 *Dicallancura decorata* (an Erycinid new to the Collection), and 19 *Delias*, of which *D. weiskei*, *callima*, *iltis*, *rothschildi*, *bornemanni*, *microsticha*, *fuliginosus*, *emilia*, *kummeri*, *kummeri* var. *ligata*, *niepelti*, *castancus*, and *aroae* are new to the Collection.

Tropical America.—52 butterflies, including many species of *Catagramma*, *Agrias*, and other *Nymphalinae*, &c., much wanted by the Collection. The localities are chiefly in Ecuador and Peru.

Eighteen Pierine butterflies from New Guinea were presented by Sir George Kenrick, F.E.S. The series includes

8 species of *Delias—bakeri*, *castaneus*, *pratti*, *kummeri* var. *ligata*, *dixeyi*, *ornytion*, *emilia*, and *meeki*, and 2 *Leuciacria acuta*, allied to *Delias*. Nearly the whole of the specimens were collected (1908–10) by C. and F. Pratt in the Arfak Mountains in N.W. New Guinea. This island, which is the metropolis of the interesting genus *Delias*, is very poorly represented in the Hope Department, and the gift of such a fine series of species is a most welcome addition to the collection of *Pierinae*. The whole of the species except *D. ornytion* are new to the University Collection.

The following specimens were presented by the late Herbert Druce, Esq., F.L.S., the kind friend whose recent death has been so great a loss to entomological science. The condition of the specimens as a whole is not good, but the localities and the species represented render the gift of special value.

Alpazacu (3,600 ft.), Rio Pastaza, E. Ecuador: collected by M. G. Palmer.—102 butterflies.

Many localities in E. Ecuador (M. G. Palmer) and one in S. Peru.—2 *Hesperidae*, 40 moths, and 1 Neuropteron.

Many localities in the Philippine Islands (J. J. Mounsey).—67 butterflies and 18 moths.

Dorei Bay, N. New Guinea (1910), collected by C. and F. Pratt, and Upper Setekwa River, Snow Mountains, Dutch New Guinea, 1910, collected by A. S. Meek.—7 butterflies and 1 moth.

Bidi, Sarawak, Borneo (1907–8), collected by C. J. Brooks.—15 moths.

Forty-two butterflies from Concepcion, Province Tucuman, N.W. Argentine (1912), were presented by the captor, C. M. Dammers, Esq. The locality renders the specimens of special interest, for we here meet with tropical forms near the southern boundary of their range. Among the Pierines are a ♂ and ♀ *Tatochila*, which Dr. Dixey refers to a species hitherto undescribed.

Three most interesting series of Hawaiian Wasps collected on three dates in 1912, on the island of Oahu, were presented

by Dr. R. C. L. Perkins, M.A., D.Sc., Jesus College, having been captured by him and J. C. Kershaw, Esq.:—(i) April 26—Makiki, below 400 ft., 38 specimens of *Odynerus nigripennis*: (ii) May 3—Lowlands near coast east of Honolulu, 21 *O. nigripennis* with the following species belonging to the same colour-group—1 *O. montanus*, 2 *ioptcryx*, 6 *Nesodynerus rudolphi*; 12 examples, divided among 3 species, of another colour-group, characterized by white bands, were also captured, together with 12, also divided between 3 species, of a third colour-group: (iii) May 10—Palolo, forest, 1,200–1,500 ft., 19 examples and two species of a colour-group characterized by dull red marks on the abdominal segments; of the group resembling *O. nigripennis*, 15 specimens of *Odynerus*, divided between three species, and, with the same colouring, 6 *Crabronidae* (Fossores) divided between 2 species; 5 examples of an Ichneumonid entering the last colour-group were also captured.

The whole of these 137 specimens arranged in their groups and in three divisions, according to date and locality, have been added to the bionomic series. They are of the utmost importance, for they prove that the members of the colour-groups into which the Hawaiian Wasps and their mimics may be divided do actually fly together and may be caught on the same day and in the same place. They also give very safe indications as to the dominant species in the groups. The collection was exhibited at the Entomological Congress, and a complete analysis of the captures is published as a note to Dr. Perkins's paper in the Trans. Ent. Soc., 1912 (p. 682 n.).

A hundred and fifteen butterflies and 17 moths from Stonecutter's Island, Hongkong (1912), were presented by the captor, Capt. R. A. Craig. The island is situated about a mile from the mainland, and it will be of great interest to study the collection in order to ascertain whether any effects of isolation are to be detected in it. The Papilios include an interesting series of 4 ♂ and 6 ♀ s of *P. polytes*. All the ♀ s were of the ♂-like form *cyrus*. The model of the commonest mimetic form of the ♀, the *polytes* f., was entirely wanting from the collection—its absence being accompanied by the

disappearance of its mimic, but not of the species to which the mimetic form belongs. Of the 6 examples of *Precis almana*, one was the wet-season form *asterie* (June, 1912), while 5 were the dry form *almana* (April, October, November).

Six cocoons of the Tineid moth *Epicephala chalybacma* were presented by E. E. Green, Esq., F.E.S., who collected them in his compound at Peradeniya, Ceylon (1912). The specimens illustrate Mr. Green's interesting account of the construction of the cocoon and the arrangement upon it of the spheres secreted by the larva (Proc. Ent. Soc., 1912, p. cvi). Two of the specimens were given to the British Museum of Natural History.

A fine set of 28 Catocalid moths was presented by E. M. Dadd, Esq., F.E.S. The specimens, nearly all of which had been bred, were partly European and partly North American.

One *Camponotus aethiops* and 2 *C. lateralis* from Chigny, Switzerland (August 24, 1912), and 3 *Aphaenogaster subterranea* from Yvorne (August), were presented by the captor, W. C. Crawley, Esq., F.E.S.

Four Odonata (dragonflies) and 2 *Ephemeridae* from Traunsee, Austria (1911), were presented by the captor, H. H. Druce, Esq., F.L.S.

Six butterflies and 111 moths from various localities in the New Forest (1912) were presented to the general collection by the captor, F. C. Woodforde, Esq., B.A., Exeter College. The specimens from these localities, presented to the British collections by the same kind donor, are acknowledged below.

Five examples of *Melitaea aurinia* (1912) captured in North Devon by G. B. Adams, Esq., were also presented by F. C. Woodforde, Esq.

Additions to the British Collections in 1912.

The following collections of several obscure and difficult but most interesting groups of Arthropoda have been presented by R. S. Bagnall, Esq., F.L.S.:—

(1) Very complete collection of British Chilopoda (Centipedes), Symphyla, Pauropoda, Diplopoda (Millipedes), in-

cluding numerous additions to the British fauna and the types of 8 new species of Symphyla.

(2) British Thysanoptera (Thrips), including types of several new species.

(3) British Terrestrial Isopoda (Woodlice), Thysanura (Bristle Tails), Collembola (Spring Tails), Anoplura (Blood-sucking lice), and Mallophaga (Biting or bird-lice), including numerous additions (some not yet recorded) to the British fauna and a few types.

(4) A collection of Thysanoptera from various parts of the world, including numerous types and co-types, is also included in addition to those named above.

Generous help to the British collections has been afforded, as in previous years, by F. C. Woodforde, Esq., B.A., Exeter College. Fine series, presented by the donor, have been already incorporated or are ready for incorporation. The following British localities are represented :—

The New Forest.—115 *Geometridae*, including several *Selidosema ericetaria* (*plumaria*) and *Pachycnemia hippocastanaria*, 185 *Noctuidae*, including several *Leucania turca* and *Panolis piniperda*, 72 Micro-Lepidoptera, 52 insects of several Orders, and 7 Lepidoptera with injuries probably inflicted by birds.

North Cornwall, near Bude (1911–12).—12 *Melitaea aurinia*, bred (May 27–31, 1912) from ova obtained in May, 1911 ; 19 moths, including 2 *Luperina cespitis*, 2 *Dianthoecia barrettii*, 4 *Botys asinalis*, 2 *Stilbia anomala*; also 6 *Carabus violaceus*, var. *exasperatus*, and 20 *C. catenulatus*, taken at sugar (July, 1910).

South Devon. Starcross.—7 *Callimorpha hera*, bred (July, 1912) from ova obtained Aug., 1911.

Abingdon.—12 *Melitaea aurinia*, bred (June, 1912).

Sutton Coldfield Park, near Birmingham, 1911.—5 specimens of the Crambid moth *Phycis fusca*.

Nineteen examples of *M. aurinia* captured, 1912, in North Devon by G. B. Adams, Esq., together with 4 examples of *Tapinostola extrema* (*concolor*) captured, 1912, in Huntingdon-

shire by — Temple, Esq., were also presented by F. C. Woodforde, Esq.

Thirty-seven examples of *Chrysophanus phlaeas*, taken on the same bank at Cerne Abbas, Dorset, in the hot August of 1911 and in the cold August of 1912, were presented by the captor, Dr. R. C. L. Perkins, M.A., D.Sc., Jesus College. Of the fourteen 1911 males 8 were dark and 6 intermediate, while the eight 1912 males were all bright; the seven 1911 females were less bright than the eight 1912 females (Proc. Ent. Soc., 1912, cxxxviii). It is very interesting that the exceedingly hot summer of 1911 should have thus reproduced in this country the Southern European form of *phlaeas*, which is well known to be darker than that of the North. It is particularly interesting that the specimens should have been taken in the two years in precisely the same locality.

A very interesting collection of beetles, taken Apr. 26–May 1, 1912, in Tiree, the most south-westerly of the Inner Hebrides, was presented by the captor, H. Donisthorpe, Esq. The series includes 280 pinned specimens or cards of specimens, the latter being numerous and well filled. These beetles have been the subject of an interesting paper by W. E. Sharpe, F.E.S., in the *Entomologist's Record*, 1913, xxv, pp. 19–23. The author argues that some of the species probably date back to the time when Tiree was continuous with the mainland.

A ♀ of the fine Tipulid fly *Pachyrrhina crocata* from Tubney, near Oxford, was presented by the captor, Mr. Joseph Collins, of the Hope Department, together with the Braconids *Caelinus niger* and *Pezomachus fasciatus* from the same locality. The latter was captured in the net with an example of the ant *Myrmica laevinodis* (Sept. 15). These two insects, which bore a very close resemblance to each other, have been added to the bionomic collection.

Two examples of the fly *Gastrophilus equi*, from the Great Hangman, Coombe Martin, N. Devon (Sept.), were presented by the captor, Dr. G. B. Longstaff.

Six examples of *Tortrix pronubana*, bred 1912, from the Bournemouth district, were presented by W. Claxton, Esq.

Three examples (1907) and 8 (1910) of *Hesperia lineola*, from Sheppey, were presented by the captor, Commander J. J. Walker, Hon. M.A., F.L.S., F.E.S. Four *Clisiocampa castrensis*, bred 1912 from larvae found and reared as in 1911 (see p. 954), were presented by the same kind friend of the Department, together with the female parent of *Nemeophila russula* and 5 of its offspring (3 ♂, 2 ♀). The parent was captured June 19, 1912, in the Blean woods, Kent; the larvae, fed upon lettuce, spun cocoons at the end of August and emerged at the end of September.

One *Formica fusca*, race *picea*, from the New Forest (July), was presented by the captor, W. C. Crawley, Esq., B.A., F.E.S., Worcester College, together with 2 examples of *Anergates atratulus* and 1 of *Tetramorium caespitum*, in whose nest they were found. The recent discovery of *Anergates* in this country in the New Forest is of the highest interest.

The following extremely rare and interesting British birds were presented by F. C. Woodforde, Esq., B.A., Exeter College:—Kite, adult male; Honey Buzzard, adult male; Marsh Harrier, adult male and female; Common Buzzard, var., adult female; Buff-breasted Sandpiper, immature, autumn; Bartram's Sandpiper, adult; Marsh Warbler, adult male and female and two eggs; Sea Eagle, immature; Osprey, male, nearly adult.

The Hope Library.

Mr. R. S. Bagnall, although unfortunately prevented from beginning his work as Assistant Curator in succession to the late R. Shelford, M.A., has during many visits to Oxford given much kind and efficient assistance to the Department and especially to the Hope Library. The following list of the accessions in 1912 is mainly due to his kind help.

Donations.

The following publications and Reports were presented:—

Bombay Natural History Society: the publications for 1912.

British Museum, Trustees of the :—

Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. xi, with Supplementary volume of plates CLXXIV—CXCI, by Sir George F. Hampson.

A Revision of the Ichneumonidae, based on the Collection in the British Museum, pt. 1, by Claude Morley.

Cambridge University : Forty-sixth Annual Report of the Museum and Lecture-Rooms Syndicate (for 1911).

Carnegie Institute of Washington, Department of Experimental Evolution : Annual Report of the Director for 1910.

Colombo Museum, Ceylon : Spolia Zeylanica, vol. viii, pts. xxix, xxx and xxxi.

Entomological Research Committee : Correspondence relating to the Development of Entomological Research in the British Colonies and Protectorates. (Presented to Parliament by Command of His Majesty.) Nov. 1912.

Indian Museum, Calcutta, Records of : Index, vol. ii ; vol. iii, pts. i–iv, and index ; vol. iv, pts. i–v ; vol. v, pts. i–iv ; Memoirs, i, no. 4, and index ; ii, nos. i–iv ; iii, no. 1.

Annual Report, 1908–9.—Annotated list of the Asiatic Beetles in the Collection of the Indian Museum, pt. i, by N. Annandale and Walter Horn. Rules, pt. i.

Instituto Oswaldo Cruz, Rio de Janeiro : Memorias, vol. i, pts. i and ii ; vol. ii, pt. ii ; vol. iii, pt. ii ; vol. iv, pt. i.

London : Local Government Board Report (New Series, No. 66) : Further Reports (No. 5) on Flies as Carriers of Infection, 1912.

Maine, University of : Agricultural Experiment Station, Orono. Five Bulletins.

Manchester Museum : Report on the Zoological Department. Session 1909–10.

Marine Biological Association of the United Kingdom : Journal, n.s., ix, no. 3, 1912.

New Jersey, Agricultural Experiment Stations : Papers, No. 242, by Dr. B. H. A. Groth, Ph.D. (1912) ; and No. 245, by Byron D. Halstead (1912).

New York State Museum: Educational Department Bulletin. Museum Bulletin, 136 (Albany, 1910); 141 (Albany, 1910).

Ottawa: Experimental Farms of Canada: three Reports for 1898, 1911, and three Separata from the forty-second Annual Report of the Entomological Society of Ontario, 1911; Bulletin No. 66 of the Central Experimental Farms, 1910; Division of Entomology, Bulletins, Nos. 2, 3, 4 and 5, 1912.

Six papers, including Farming in Canada, 1908. Report of Scottish Agricultural Commission (Edinburgh and London, 1909).

Pennsylvania, University of: Contributions from the Zoological Laboratory, 1912, vol. xvii.

Philadelphia: The Academy of Natural Sciences of Philadelphia, vol. xv, Second Series.

Radcliffe Library: Catalogue of Books added to the Library in 1911.

Rhodesia, Agricultural Department: *Rhodesian Agricultural Journal*, Oct. 1905.

Rhodesian Museum, Bulawayo: Tenth Annual Report (1911).

Royal College of Surgeons: Annual Museum Report, 1912.

Sarawak Museum: Report for 1911; Journal, vol. i, Nos. 1–2, 1911–12.

Smithsonian Institution, Washington: Memoirs by the following authors:—INSECTA. T. D. A. Cockerell (2 memoirs), J. C. Crawford (2), Harrison G. Dyar, H. T. Fernald, J. R. Malloch, W. D. Pierce, J. A. G. Rehn, S. A. Rohwer (2), C. H. T. Townsend, H. L. Veireck (2), C. B. Wilson. CRUSTACEA. W. T. Calman, G. D. Marsh, A. S. Pearce, H. A. Pilsbry, Harriet Richardson (9), C. B. Wilson.

United States Department of Agriculture, Bureau of Entomology: Publications for 1912:—A special publication on the Mexican Cotton Boll Weevil; 27 Bulletins and

indices for Bulletins 80, 82, 90 and 91 ; 20 Circulars ; Technical Series, 9 separata, and 5 Farmers' Bulletins. The publications include an important paper on Life History and Bionomics of N. American Ticks, by W. A. Hooker, F. C. Bishopp, and H. P. Wood ; The Behaviour of the Honey Bee in Pollen Collecting, by Prof. D. B. Casteel, Ph.D. (Washington, 1912) ; Results of the Artificial Use of the White-Fungus Disease in Kansas, by Prof. F. H. Billings and Prof. P. A. Glenn (Washington, 1911) ; Calosoma Sycophanta, by A. F. Burgess (Washington, 1911).

The following authors have presented their publications to the Library :—

R. S. Bagnall : A valuable series of 5 papers on Thysanoptera (including "Thysanoptera" in the "Fauna Hawaiiensis", Cambridge, Dec. 1910), 1 on Protura, 1 on Crustacea, 1 on Symphyla and 1 on Myriopoda, together with memoirs by the following authors :—20 papers on Crustacea, including 3 valuable 4to monographs (20 plates), by Dr. H. J. Hansen, and several important papers and monographs by Prof. G. S. Brady, F.R.S., Rev. T. R. R. Stebbing, F.R.S., Dr. W. M. Tattersal, Dr. W. T. Calman, E. G. Racovitza and Alex. Patience ; 5 papers on Lepidoptera (4 by Dr. T. A. Chapman and 1 by H. S. Leigh), Sharp and Fowler's Cat. of British Coleoptera, and R. South's Syn. List of British Lepidoptera ; 2 papers on Thysanoptera by R. Coesfeld and Dr. H. Uzel respectively.

Nathan Banks : Thirty-three papers on Insecta (Hymenoptera, Neuroptera, Hemiptera, Diptera) and Arachnida, including Catalogue of Nearctic Spiders (Washington, 1910).

E. Brunetti : The Fauna of British India, Diptera Nematocera (excluding *Chironomidae* and *Culicidae*).

Malcolm Burr, M.A., D.Sc., New College : Six papers chiefly on Dermaptera.

H. Eltringham, M.A., F.Z.S., F.E.S., New College : a bound and interleaved copy of his monograph of the genus *Acraea*, 1911. Mr. Eltringham kindly proposes to enter in this volume any additional facts that may be discovered or

corrections that require to be made with the progress of knowledge.

T. Bainbrigge Fletcher, R.N., F.E.S., Director of the Agric. Coll. and Res. Inst., Coimbatore, Madras: Twenty-three papers, chiefly on *Ornecodidae* and *Pterophoridae* and on Economic Entomology, including "The *Ornecodidae* and *Pterophoridae* of the Seychelles Expedition" and "Lepidoptera exclusive of the *Tortricidae* and *Tineidae*" (Percy Sladen Trust Exped. to the Indian Ocean in 1905, Trans. Linn. Soc., London); together with a paper on Ceylonese *Tetriginae*, by J. L. Hancock, and Bulletins Nos. 23 and 29 of the Agricultural Research Institute, Pusa, 1912.

Prof. F. Hermann, of Erlangen: Monograph of the *Asilidae* in Beitr. zur Kenntnis der Süd-Amerikanischen Dipterenfauna (Abh. der Kaiserl. Leop.-Carol. Deutschen Akad. der Naturforscher, xcvi).

J. Douglas Hood: Eight papers on the Thysanoptera of North America.

Prof. A. D. Imms: Two papers including one on Collembola from India, Burma, and Ceylon.

Prof. Aug. Lameere: Revision des Prionides (Mémoires 1–20).

G. B. Longstaff, M.A., D.M., F.R.C.P., New College: "Butterfly Hunting in Many Lands", London, 1912; subsequently a second copy with the index revised, and 2 papers from the "Entomologist's Monthly Magazine", together with Vol. *Amathusiidae* of "Das Tierreich" by H. Stichel, Berlin, 1912, and a paper on Mimicry in Boreal American Rhopalocera by Dr. Hy. Skinner.

J. C. Moulton, B.Sc., Magdalen College. A list of the Butterflies of Borneo.

Rev. Father R. P. Longinos Navás, S. J.: Four papers on Neuroptera.

M. Charles Oberthür: Études de Lépidoptérologie Comparée. Fascicule vi. Rennes, 1912. This splendid volume (pp. 1–355) is illustrated by the most exquisitely coloured Plates, numbered xcvii–clx, as well as by many reproductions of photographs.

W. Schaus: Eight papers on Neotropical Lepidoptera.

Hugh Scott, M.A.: Two papers including Coleoptera (*Lamellicornia* and *Adephaga*) in the Percy Sladen Trust Expedition to the Indian Ocean in 1905. (Trans. Linn. Soc., London, XV, pt. 2.)

Rev. T. R. R. Stebbing, M.A., F.R.S., Worcester College: The Sympoda (Part VI of S. A. Crustacea for the Marine Investigations in South Africa). (Ann. S. A. Museum, Vol. X.)

Prof. Fred V. Theobald: Ten papers chiefly dealing with the *Culicidae* and British Aphids, together with one paper on *Culicidae* by E. H. Strickland.

Dr. Ivar Trägärdh: A valuable set of 22 papers chiefly dealing with the *Acaridae* (including certain Myriopodophilous forms), including the report on the *Acari* in the Results of the Swedish Zoological Expedition to Egypt and the White Nile, 1901, and the *Acari* of the Swedish South Polar Expedition.

Rowland E. Turner, F.E.S.: Five papers on Fossorial Hymenoptera.

A. O. Walker: Sixteen papers on Crustacea including Amphipoda Hyperiidea of the "Sea Lark" Expedition, and Amphipoda Gammaridea from the Indian Ocean, British East Africa, and the Red Sea (Percy Sladen Trust Expedition to the Indian Ocean in 1905, Trans. Linn. Soc., London); *Amphipoda* in the Report on the Pearl Oyster Fisheries of the Gulf of Manaos, and Amphipoda in the National Antarctic Expedition, Vol. III.

Rev. Father Eric Wasmann, S.J.: A valuable series of sixteen papers on Myrmecophilous and Termitophilous forms and their hosts, published 1905–10, including "Zur Kenntniss der Ameisen und Ameisengäste von Luxemburg", in three parts, Die psychischen Fähigkeiten der Ameisen, Stuttgart, 1909.

Original papers have also been presented by the following authors: W. G. Allee (Bionomic); Prof. T. Hudson Beare; the late Col. C. T. Bingham (2 memoirs); Dr. Ignacio Bolivar and C. Ferrière; A. E. Cameron; Prof. G. H. Carpenter

(2 memoirs, one in conjunction with Mabel C. MacDowell); Dr. Alfons Dampf; A. d'Orchymont (2 memoirs); Herbert Druce; Richard Ebner (2 memoirs); J. A. Gilruth (2 memoirs, one in conjunction with Dr. Georgina Sweet); E. Ernest Green (2 memoirs); C. Gordon Hewitt, D.Sc., Dominion Entomologist, Ottawa (2 memoirs); P. H. Grimshaw; J. C. Kershaw (2 memoirs); Frederick Knab (15 short memoirs and notes); Joseph Mangan; G. Meade-Waldo; F. Merrifield; E. Meyrick, F.R.S.; F. Muir and J. C. Kershaw (2 memoirs); E. Olivier (2 memoirs); E. F. Phillips; H. Rowland-Brown (2 memoirs bound in one); Victor E. Shelford (3 memoirs, Bionomic, and 1 review); Dr. Yngve Sjöstedt (2 memoirs); H. Viehmeyer (Ameisen aus Deutsch-Neuguinea); Rev. Jas. Waterston; J. Henry Watson; Dr. Creighton Wellman.

Valuable additions to the Library have also been presented by the following donors :—

Mrs. P. B. Mason : Manuscript Vol. Novitates Staintonianae, with coloured figures, 1842. This interesting and valuable manuscript belonged to the library of the late P. B. Mason, F.E.S.; Mr. C. O. Waterhouse very kindly suggested the Hope Library to the donor.

F. Merrifield, F.E.S.: A copy of "African Mimetic Butterflies", Oxford, 1910, by H. Eltringham.

G. A. James Rothney, F.E.S.: Two papers on Ants, by H. Donisthorpe, F.E.S.; Ent. Soc. Trans., 2 vols., 1910–11, bound uniformly with the series already given by the generous donor; Ants and their Ways, by Farren White; The Malay Archipelago, by A. R. Wallace, 1872; The Naturalist on the Amazon, in 2 vols., by H. W. Bates, 1863 (original edition); Travels amongst the Great Andes of the Equator, Ed. Whymper, 1892, and Supplement, 1891; The Humble Bee, by F. W. L. Sladen, 1 vol., 1912.

Hon. Walter Rothschild, F.R.S.: The parts of the Novitates Zoologicae of the Tring Zoological Museum published in the year 1912.

R. Shelford, M.A., F.Z.S., F.E.S.: The following memoirs presented by the late R. Shelford in 1911 were accidentally omitted from the Report of that year:—12 separata, chiefly dealing with Orthoptera and Coleoptera (*Hispidae*), by Ermanno Giglio-Tos, R. Gestro, and Achille Griffini, and including Dr. H. Schubotz's report of the German Central-African Expedition of 1907–8.

Miss Shelford: 43 separata, originally belonging to the late Assistant Curator, have been kindly presented by his sister. The series includes 5 papers by the late R. Shelford (pub. 1911–12) and others by Burr (Dermaptera), Griffini (*Gryllacridae*), Shiraki (Phasmids and Mantids of Japan), Handlirsch (Fossil Insects), Froggatt (Economic), V. E. Shelford (Bionomic), and 10 mem. of the U. S. Dept. Agriculture.

Separata on the important subject of Nomenclature, from the First Internat. Congr. Ent. (Brussels, 1912) and the Entomological News, have also been presented to the library.

The Professor:

The publications of the Société Entomologique de France for 1912; and of the Société Entomologique de Belgique for 1912; the publications of the Linnean Society for 1912; the Transactions of the Entomological Society of London for 1912; the Journal of Economic Biology, 1912; Boletín XII (1912) de la Real Sociedad Española de Historia Natural; Bulletin of Entomological Research, vol. i, pts. 1, 2, and 3, vol. iii, pts. 1–3; Lancashire and Cheshire Entomological Society, Annual Report for 1911; Festschrift Herrn Prof. Dr. J. A. Palmén, Helsingfors, gewidmet vols. i and ii.

Exchanges.

The parts of the following journals for the year 1912 were received in exchange for the Hope Reports:—

Deutsche Entomologische National-Bibliothek.

Deutsche Entomologische Zeitschrift.

Entomologisk Tidskrift, Stockholm.

Bulletin de la Société Entomologique Suisse.

Purchases.

The following publications of the year 1912 were purchased for the Department :—The volume of the Ray Society, of the Zoological Record, the numbers of the Entomologist's Monthly Magazine, the Entomologist, and the Entomologist's Record.

In addition to these regular purchases there were also bought :—The parts issued in 1912 of Lepidopterorum Catalogus, Wagner, Berlin; and a second-hand copy of Rhopalocera Aethiopica, by Prof. Chr. Aurivillius, Stockholm, 1898.

E. B. POULTON.